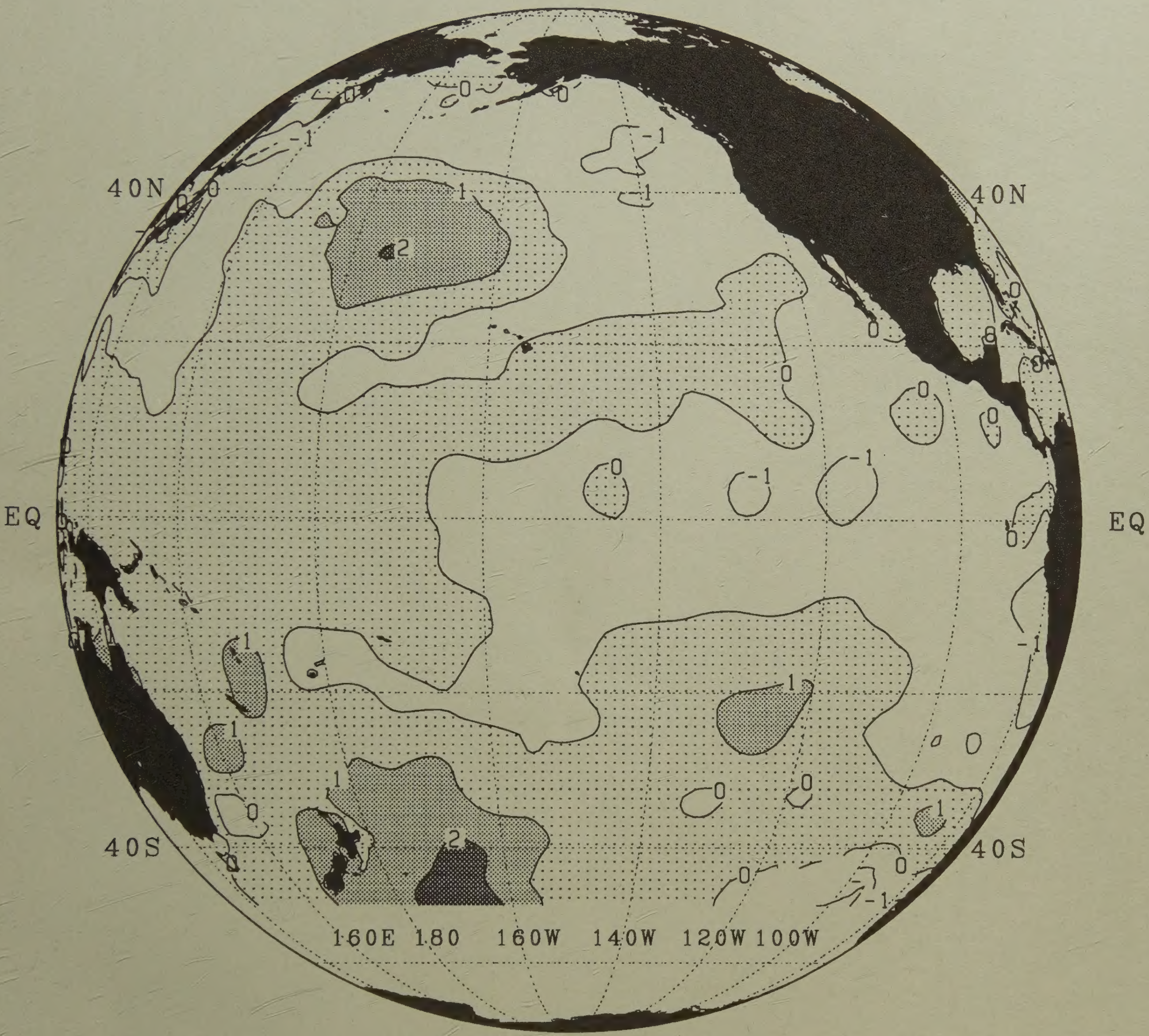
# 気 象 庁 海 洋 月 報

## Monthly Ocean Report
## December 2001 (No. 108)





Climate and Marine Department

Japan Meteorological Agency

気象庁 気候・海洋気象部


平成13年12月

気象庁海洋月報は、気象庁 気候・海洋気象部 海洋気象情報室で作成しています。
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Monthly Ocean Report is prepared by the Office of Marine Prediction, Climate and Marine Department, Japan Meteorological Agency.

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表紙は、2001 年 12 月の太平洋の月平均海面水温偏差図です。
陰影部は、平年より高温の海域を示しています。

The figure on the front cover shows the monthly mean SST anomalies for December 2001 in the Pacific Ocean.
Areas of positive anomalies are shaded.

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# 海況の特徴（２００１年１２月）

## 日本近海の海況

海面水温は、日本海北部、オホーツク海南部から千島列島・北海道太平洋岸にかけてと東海地方沿岸で平年より１℃以上低かった。一方、常磐沖には＋２℃を超える正偏差が見られた（第４図）。

黒潮は、東海沖を東に流れ、八丈島の北を通過していた。上・中旬は 33° N、142° E 付近から北に向きを変え、蛇行しながら常磐沖を北上して 38.5° N まで達していた。下旬は 33° N、140° E 付近から北東に向きを変え、38.5° N まで北上していた（第９図）。

## 太平洋の海況

太平洋赤道域の海面水温は、145° E付近と165° E付近で平年より0.5℃以上高かった。135° Wから105° Wにかけてと95° W付近では平年より0.5℃以上低く、ペルー沖では-１℃を超える負偏差が見られた。

北太平洋の海面水温は、25° N から 45° N の 175° E から 160° W にかけて平年より 1℃以上高かった。一方、千島列島周辺とカナダ西岸沖の 45° N、140° W 付近では-１℃を超える負偏差が見られた（第１７図）。

# Highlights December 2001

## Seas adjacent to Japan

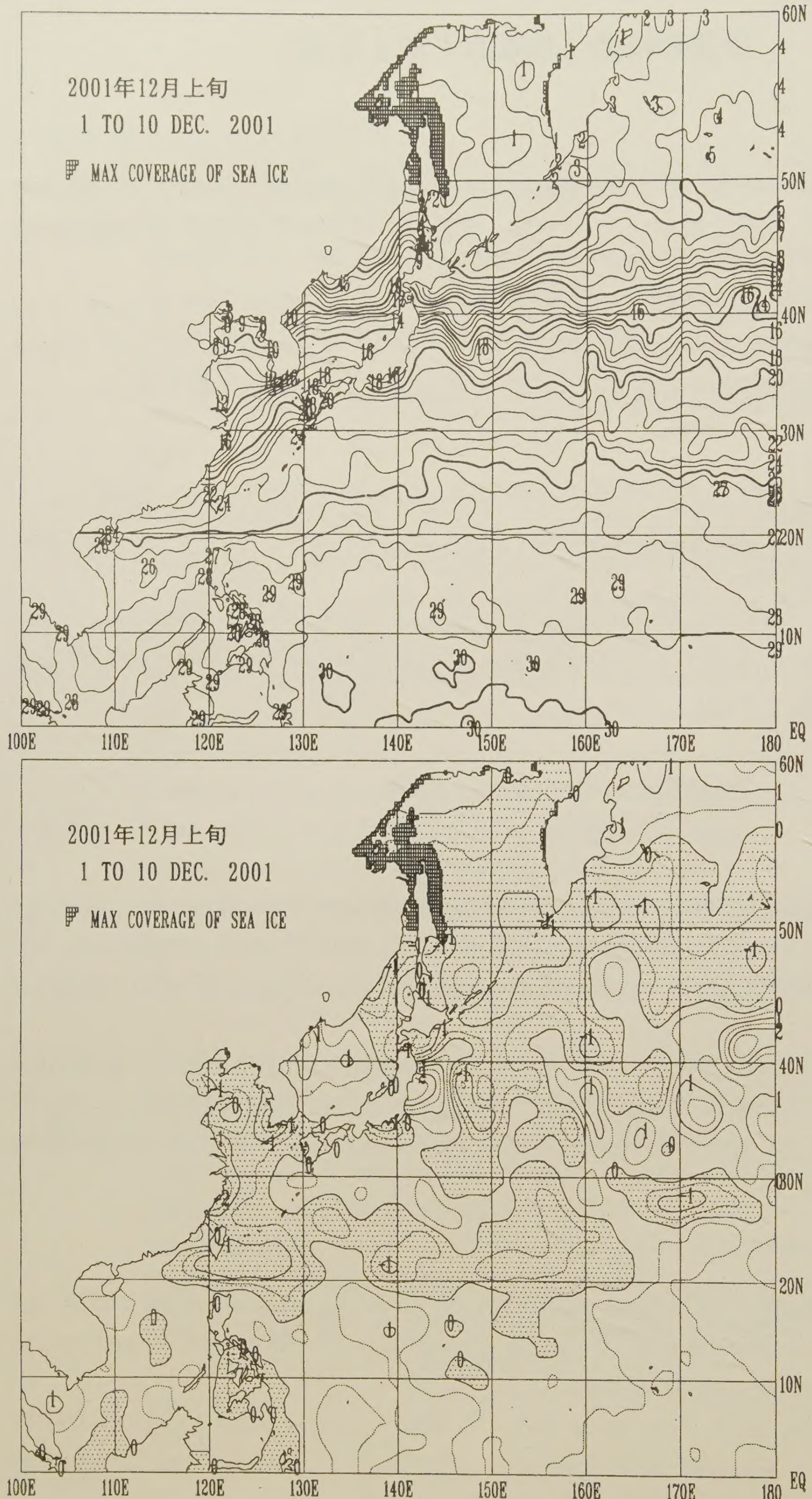
SSTs were more than 1℃ below normal in the northern part of the Japan Sea, from the southern part of the Sea of Okhotsk to the seas around the Kurile Islands, south of Hokkaido, and in the seas along the coast of Tokai. Positive SST anomalies exceeding +2℃ were found off Joban (Fig. 4).

The Kuroshio flowed eastward off Tokai and passed north of Hachijo Island. In the first and second 10-days of the month, it turned northward near 33°N, 142°E and flowed to 38.5°N meandering off Joban. In the rest of the month, it turned NE-ward near 33°N, 140°E and flowed to 38.5°N (Fig. 9).

## Pacific Ocean

In the equatorial Pacific, SSTs were more than 0.5℃ above normal around 145°E and around 165°E. SSTs were more than 0.5℃ below normal from 135°W to 105°W and around 95°W, and more than 1℃ below normal off Peru.

In the North Pacific, SSTs were more than 1℃ above normal from 175°E to 160°W between 25°N and 45°N. Negative SST anomalies exceeding -1℃ were found around the Kurile Islands and around 45°N, 140°W west of Canada (Fig. 17).



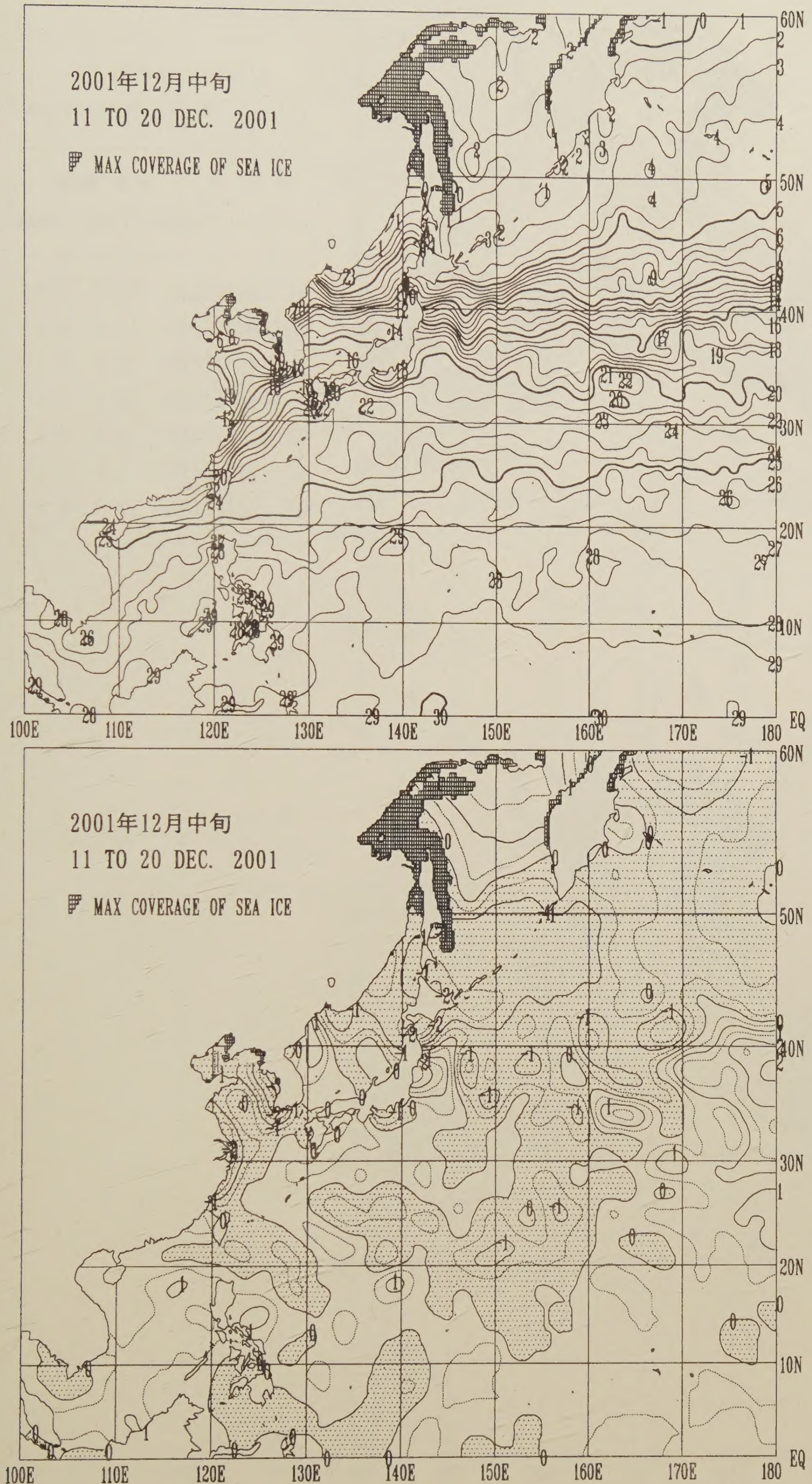

旬平均沿岸水温 (℃)
Coastal Water Temperature

| 地点名 (Index Number) | 水温 Temp. | 偏差 Anom. |
|---|---|---|
| 石　垣 (47918) | 24.0 | 0.9 |
| 御前崎 (47655) | 14.2 | -0.5 |
| 八丈島 (47678) | 21.2 | 1.4 |
| 小名浜 (47598) | 16.4 | 2.3 |
| 宮　古 (47585) | 12.6 | -0.4 |
| 江　差 (47428) | 8.2 | -1.1 |
| 浜　田 (47755) | 16.4 | 0.3 |

第1図 北西太平洋旬平均海面水温図(上)及び偏差図(下) (2001年12月上旬)

Fig. 1 Ten-day mean SST (top) and anomalies (bottom) in the western North Pacific for the 1st ten-day period in DEC 2001. Anomalies are computed from the JMA climatology (1971-2000). Contour interval is 1°C and additional anomaly contours of 0.5°C are shown by broken lines. Negative anomalies are spotted.

Ten-day mean SST & Anomalies

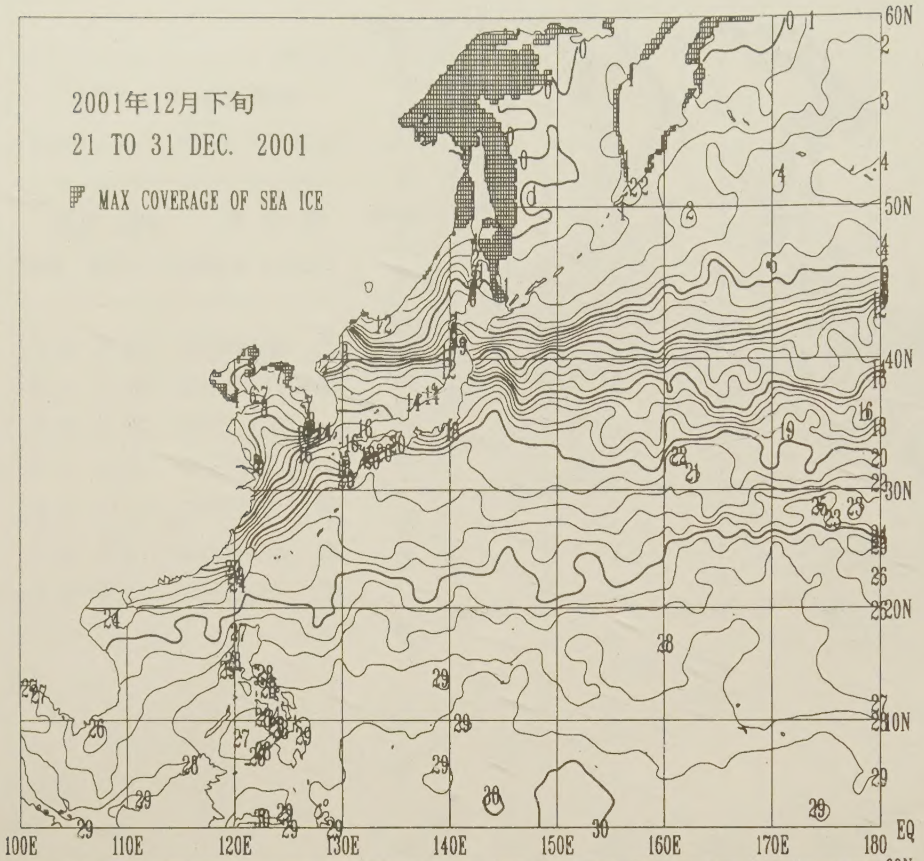



旬平均沿岸水温(℃)
Coastal Water Temperature

| 地点名 (Index Number) | 水温 Temp. | 偏差 Anom. |
|---|---|---|
| 石　垣(47918) | 23.4 | 0.9 |
| 御前崎(47655) | 12.3 | -1.5 |
| 八丈島(47678) | 20.0 | 0.9 |
| 小名浜(47598) | 14.5 | 1.2 |
| 宮　古(47585) | 11.1 | -0.8 |
| 江　差(47428) | 5.8 | -2.3 |
| 浜　田(47755) | 14.9 | -0.2 |

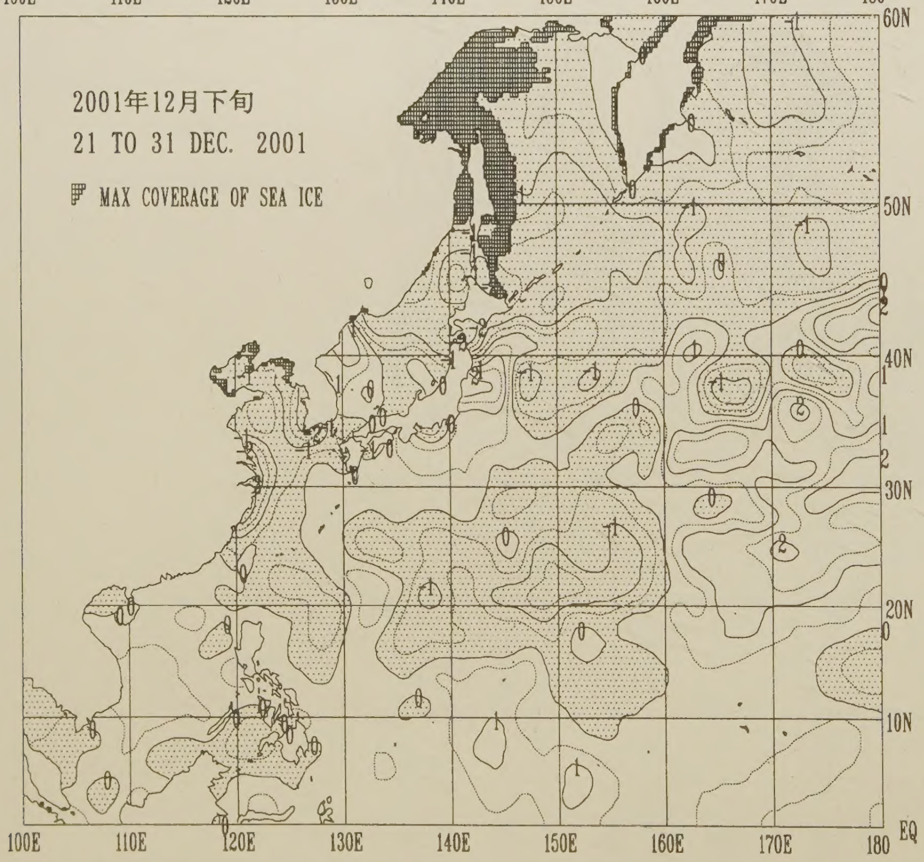
第2図 北西太平洋旬平均海面水温図(上)及び偏差図(下)(2001年12月中旬)

Fig. 2 Ten-day mean SST (top) and anomalies (bottom) in the western North Pacific for the 2nd ten-day period in DEC 2001. Anomalies are computed from the JMA climatology (1971-2000). Contour interval is 1°C and additional anomaly contours of 0.5°C are shown by broken lines. Negative anomalies are spotted.



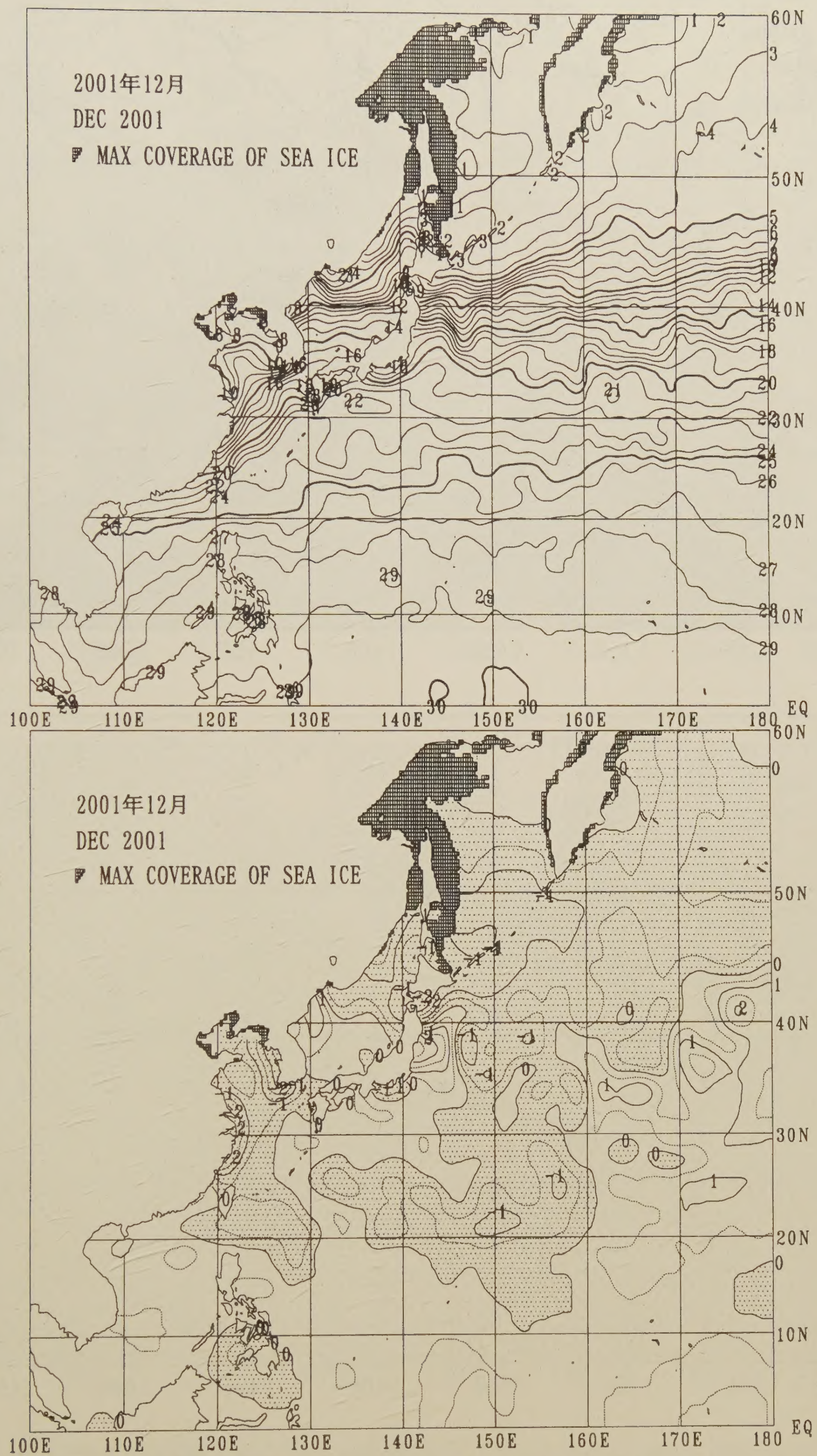

旬平均沿岸水温(℃)
Coastal Water Temperature

| 地点名 (Index Number) | 水温 Temp. | 偏差 Anom. |
|---|---|---|
| 石　垣(47918) | 21.6 | -0.4 |
| 御前崎(47655) | 11.8 | -1.2 |
| 八丈島(47678) | 19.0 | 0.5 |
| 小名浜(47598) | 13.7 | 1.4 |
| 宮　古(47585) | 9.0 | -1.9 |
| 江　差(47428) | 6.6 | -1.1 |
| 浜　田(47755) | 13.9 | -0.2 |



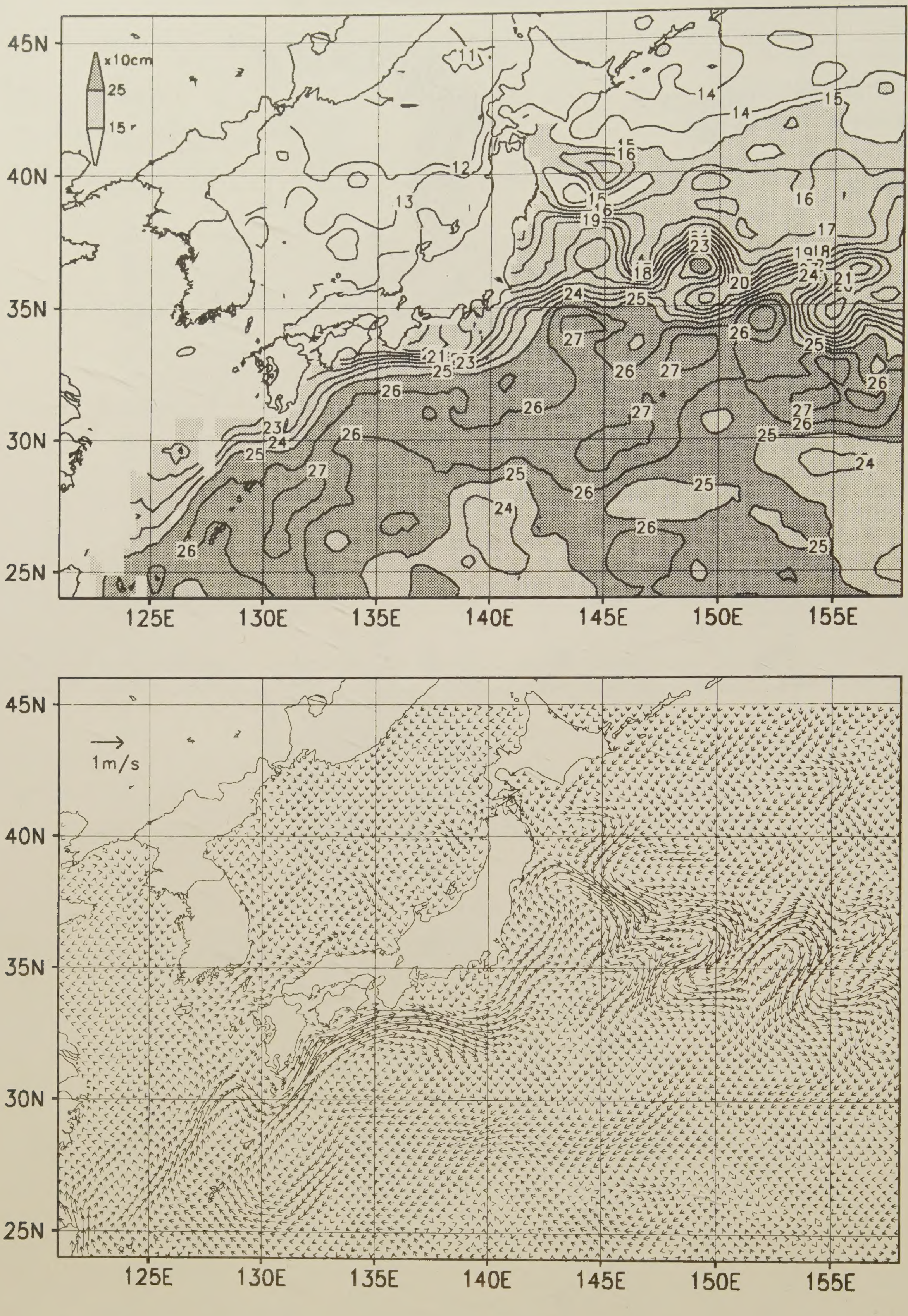

第3図 北西太平洋旬平均海面水温図(上)及び偏差図(下)(2001年12月下旬)

Fig. 3 Ten-day mean SST (top) and anomalies (bottom) in the western North Pacific for the 3rd ten-day period in DEC 2001. Anomalies are computed from the JMA climatology (1971-2000). Contour interval is 1°C and additional anomaly contours of 0.5°C are shown by broken lines. Negative anomalies are spotted.



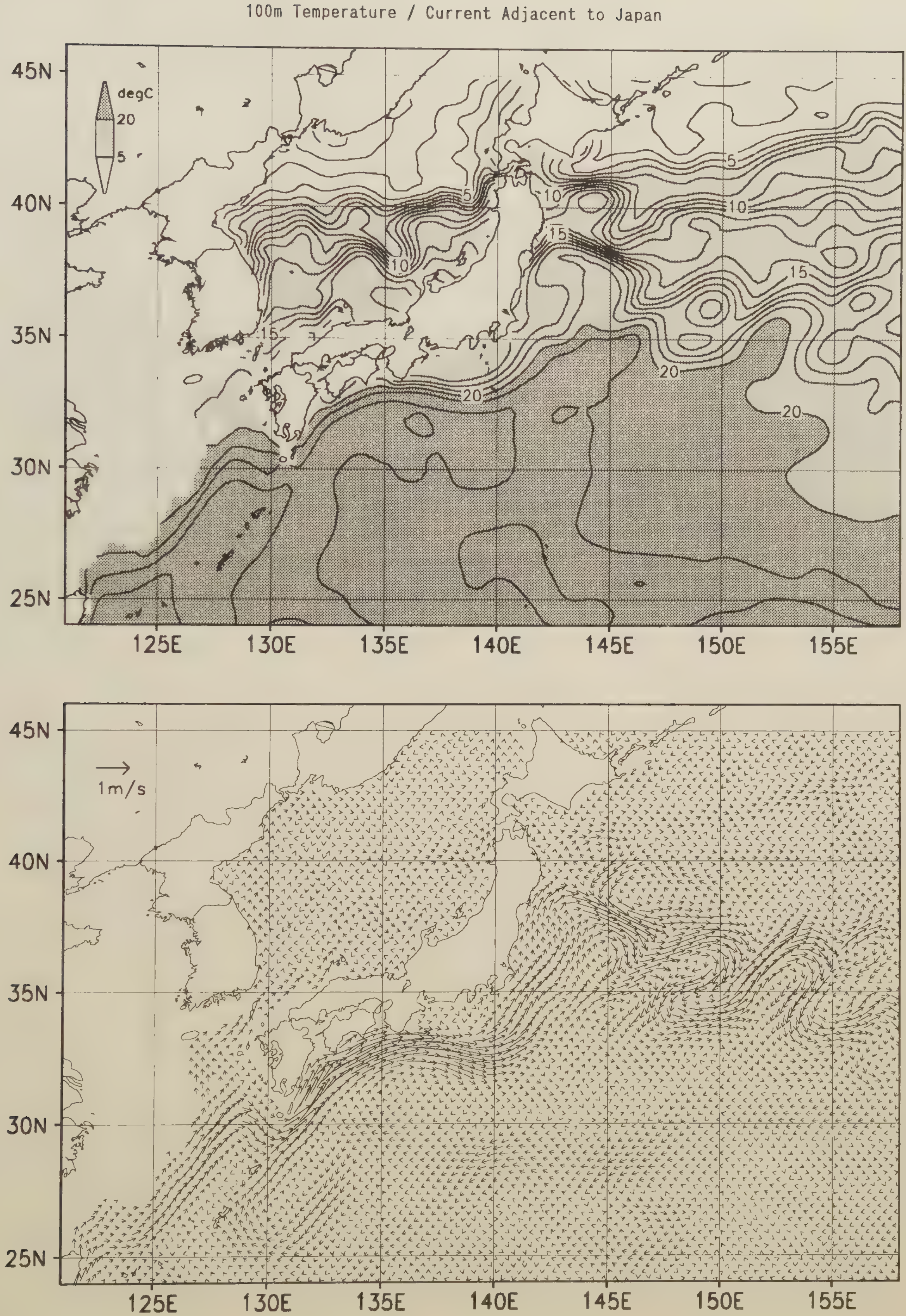

第4図 北西太平洋月平均海面水温図(上)及び偏差図(下)(2001年12月)

Fig. 4 Monthly mean SST (top) and anomalies (bottom) in the western North Pacific for DEC 2001. Anomalies are computed from the JMA climatology (1971-2000). Contour interval is 1°C and additional anomaly contours of 0.5°C are shown by broken lines. Negative anomalies are spotted.



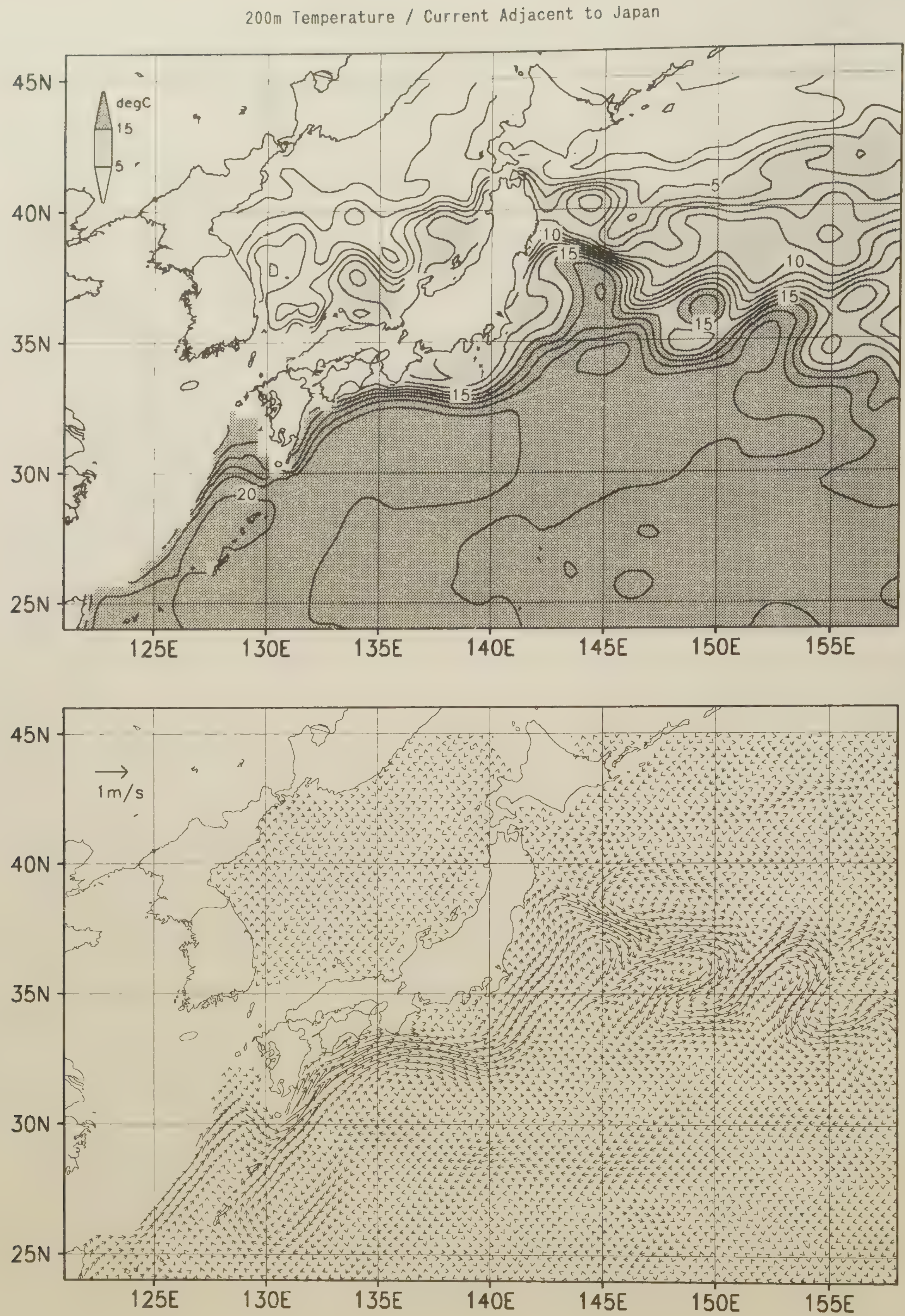

第 5 図　日本近海月平均海面高度分布図 (上) と海面海流図 (下) (2001 年 12 月)
(海洋総合解析システムによる)

Fig. 5　Monthly mean sea surface height (top) and current (bottom) in seas adjacent to Japan for December 2001. Contour interval is 10cm (top). (calculated by the Ocean Comprehensive Analysis System)



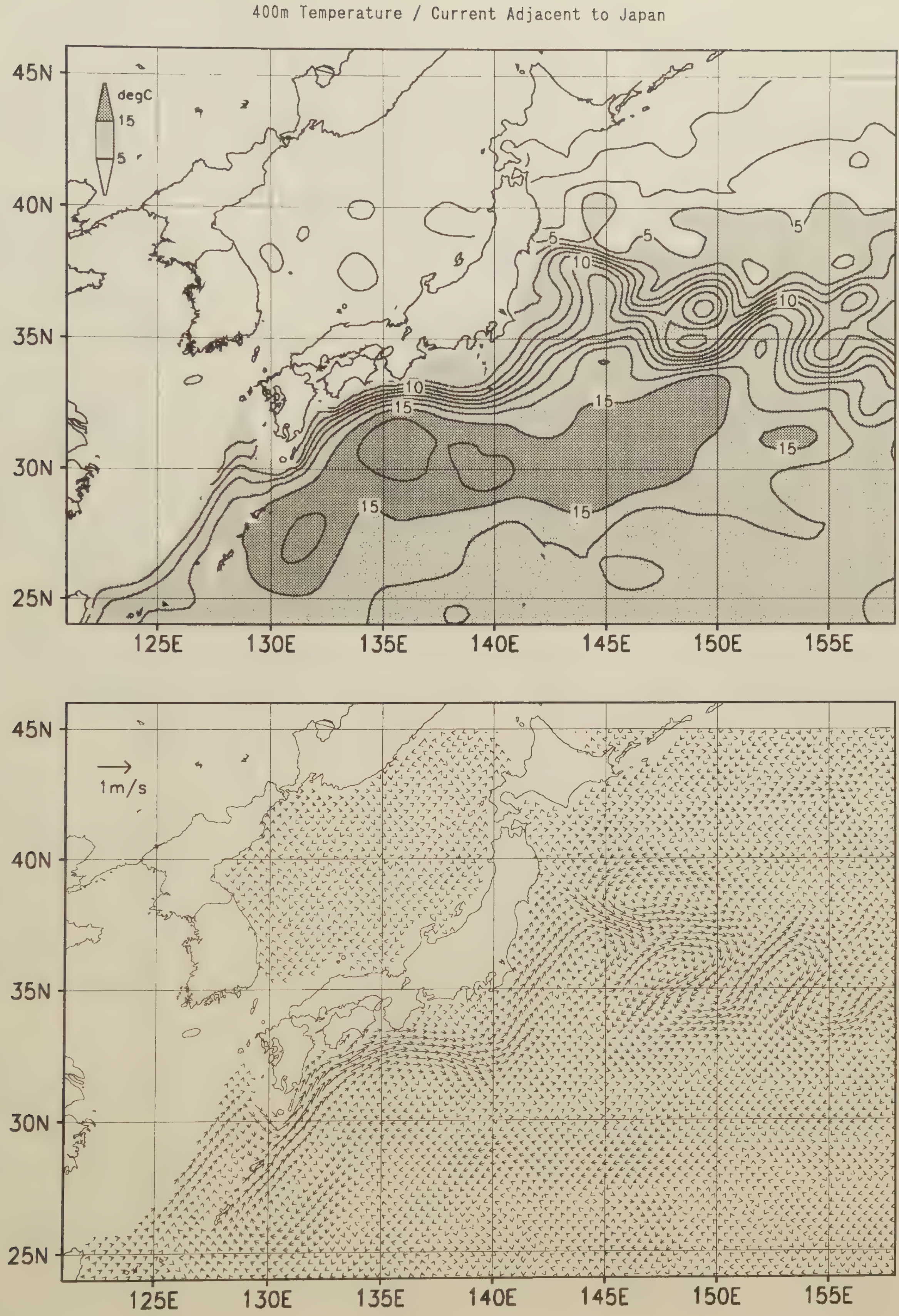

第６図　日本近海月平均表層水温図（上）と表層海流図（下）（深さ 100 m）（2001 年 12 月）
（海洋総合解析システムによる）

Fig. 6　Monthly mean subsurface (100 m) temperature (top) and current (bottom) in seas adjacent to Japan for December 2001. Contour interval is 1 ℃ (top). (calculated by the Ocean Comprehensive Analysis System)



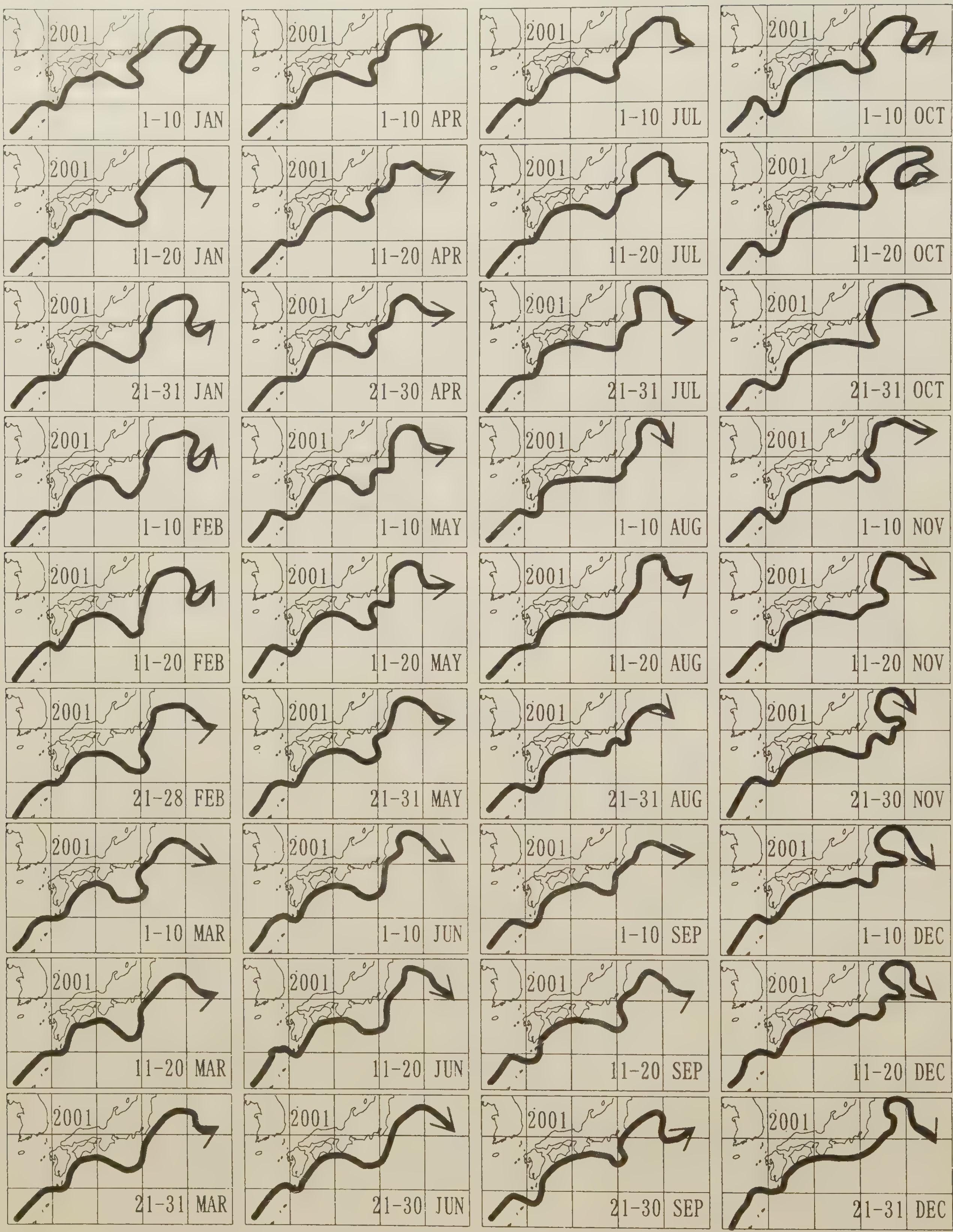

第7図　日本近海月平均表層水温図（上）と表層海流図（下）（深さ 200 m）（2001 年 12 月）
（海洋総合解析システムによる）

Fig. 7　Monthly mean subsurface (200 m) temperature (top) and current (bottom) in seas adjacent to Japan for December 2001. Contour interval is 1 ℃ (top). (calculated by the Ocean Comprehensive Analysis System)



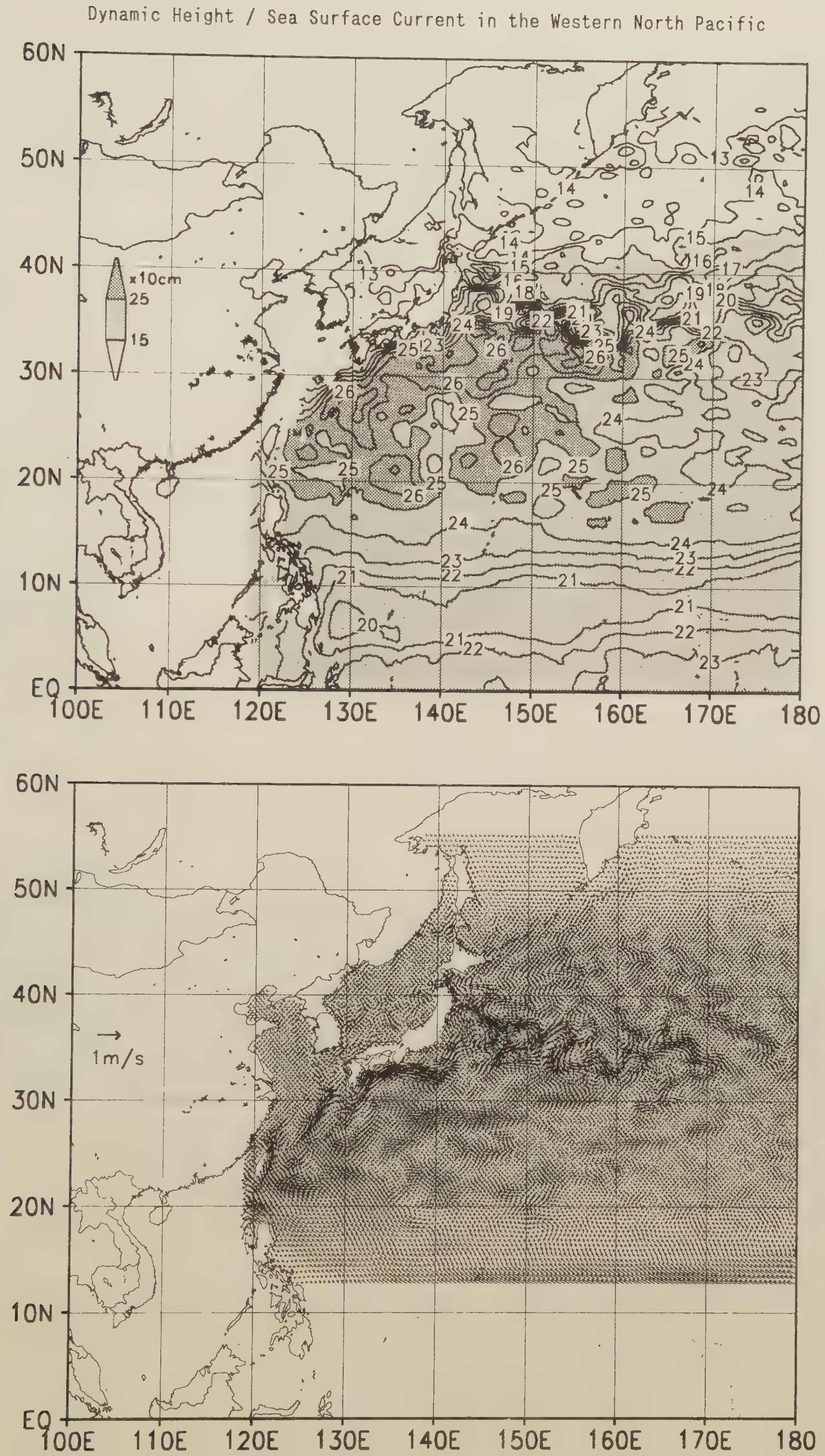

第 8 図　日本近海月平均表層水温図（上）と表層海流図（下）（深さ 400 m）(2001 年 12 月)
（海洋総合解析システムによる）

Fig. 8　Monthly mean subsurface (400 m) temperature (top) and current (bottom) in seas adjacent to Japan for December 2001. Contour interval is 1 ℃ (top). (calculated by the Ocean Comprehensive Analysis System)




第9図 旬別黒潮流軸図

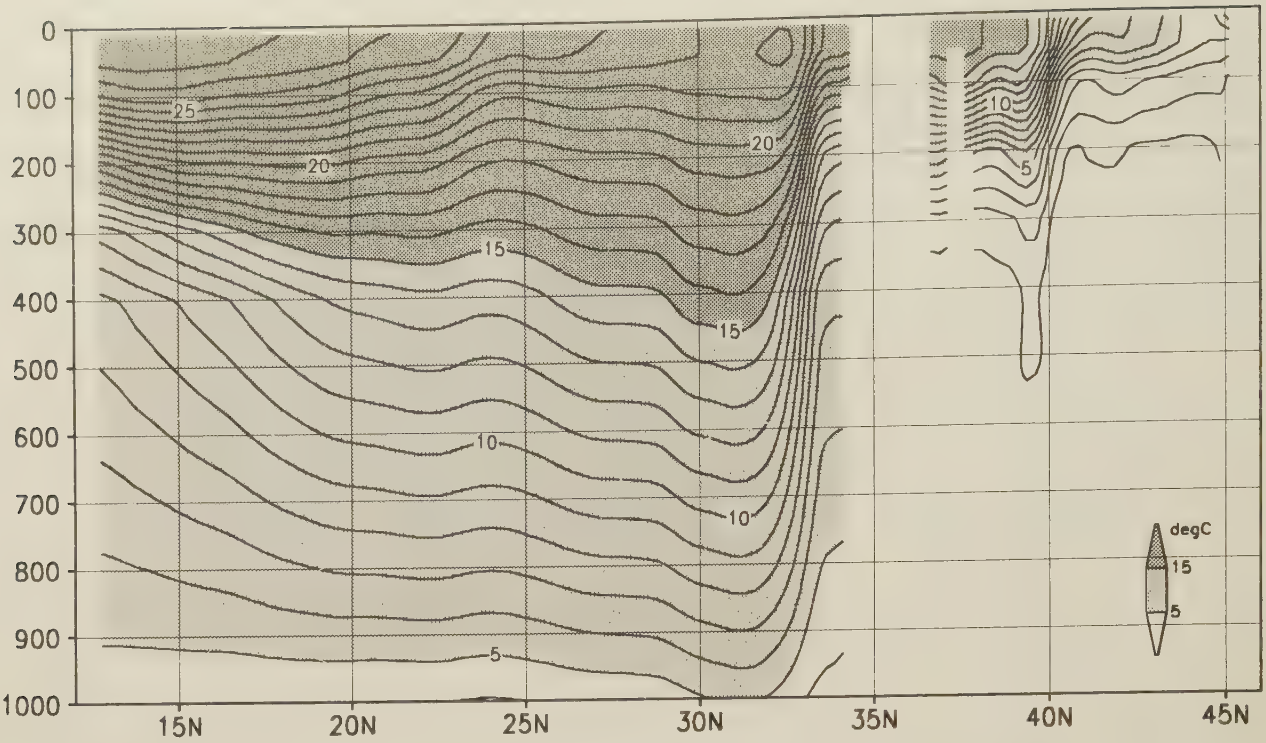
Fig. 9 Location of the Kuroshio axis




第 10 図　北西太平洋月平均海面高度分布図 (上) と海面海流図 (下) (2001 年 12 月)
(海洋総合解析システムによる)

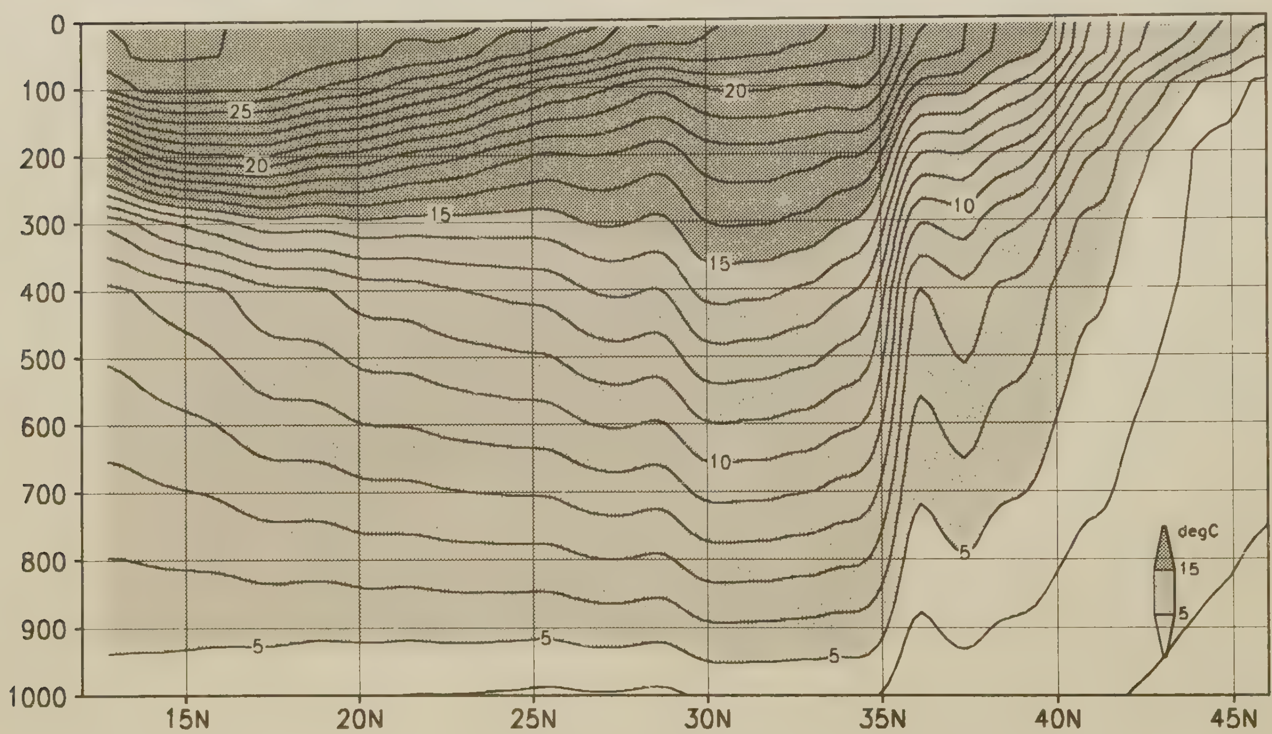
Fig. 10　Monthly mean sea surface height (top) and current (bottom) in the western North Pacific for December 2001. Contour interval is 10cm (top). (calculated by the Ocean Comprehensive Analysis System)

Depth-Latitude Sections of Temperature along 137E / 165E



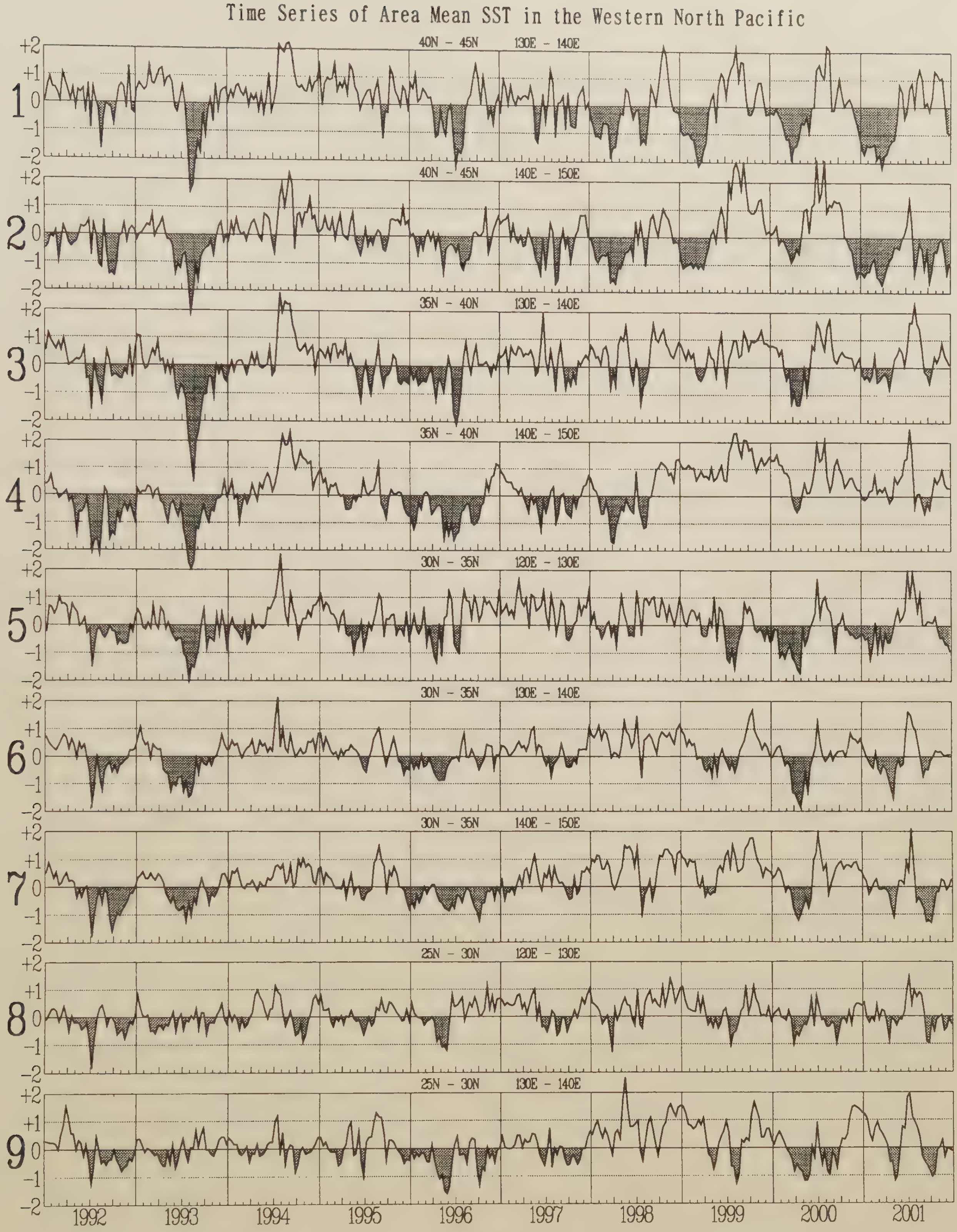

第 11 図　東経 137° 線に沿う月平均表層水温の鉛直断面図 （2001 年 12 月）
（海洋総合解析システムによる）

Fig. 11　Vertical cross section of monthly mean temperature along 137 °E for December 2001. Contour interval is 1 ℃. (calculated by the Ocean Comprehensive Analysis System)



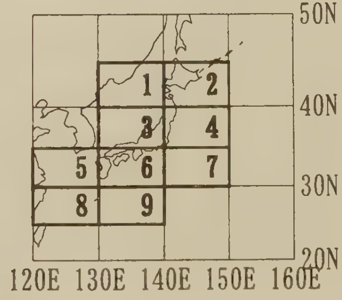

第 12 図　東経 165° 線に沿う月平均表層水温の鉛直断面図 （2001 年 12 月）
（海洋総合解析システムによる）

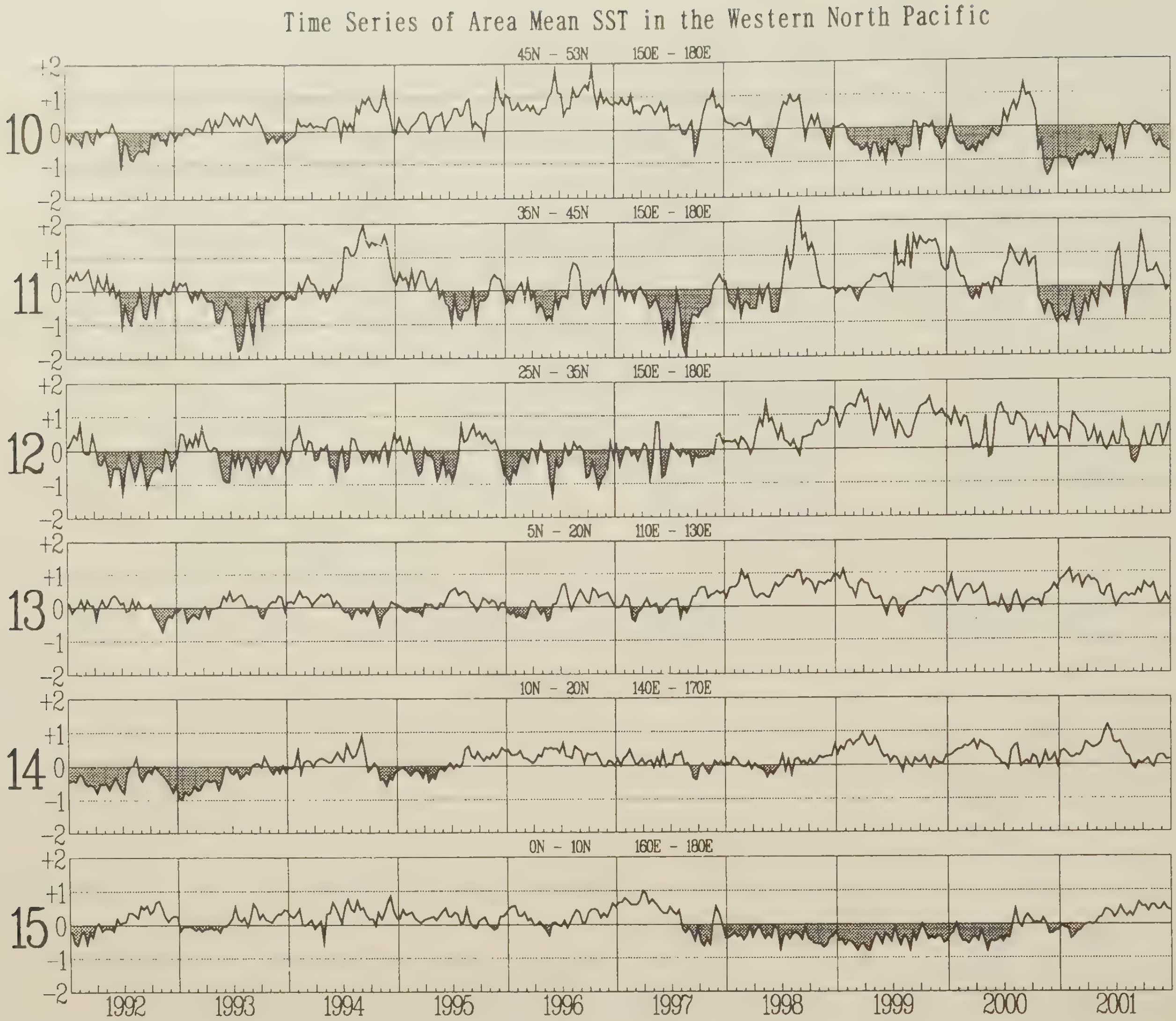
Fig. 12　Vertical cross section of monthly mean temperature along 165 °E for December 2001. Contour interval is 1 ℃. (calculated by the Ocean Comprehensive Analysis System)

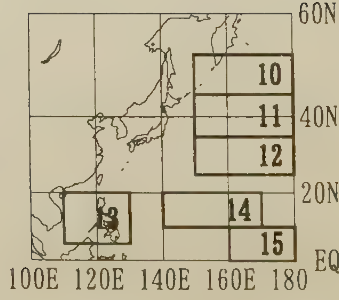



第13図　海域別旬平均海面水温平年偏差時系列図

Fig. 13 Time series of the ten-day mean SST anomalies (°C) in the western North Pacific for the areas shown in the right panel. Negative anomalies are shaded. Anomalies are computed from the JMA climatology (1971-2000).

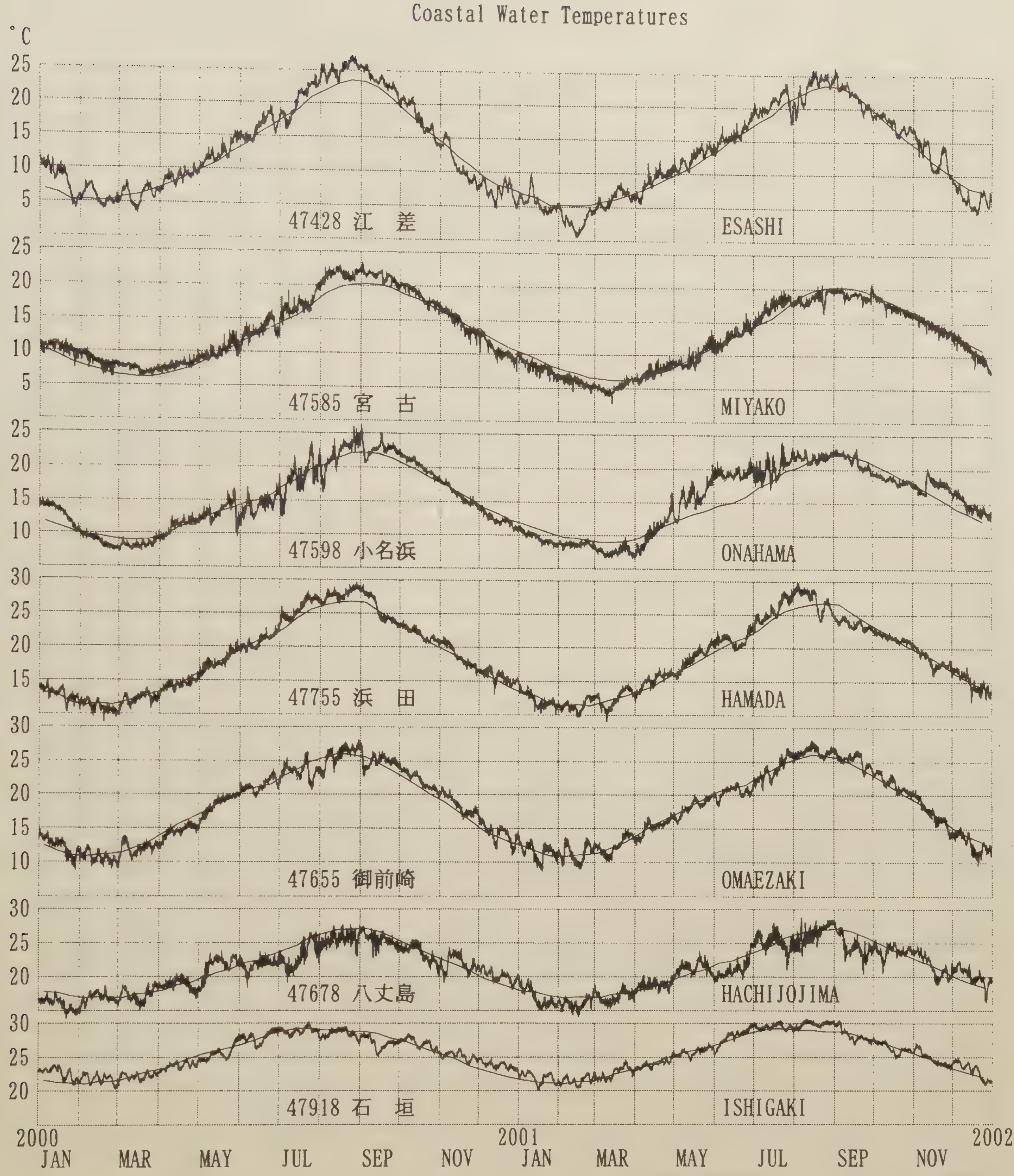


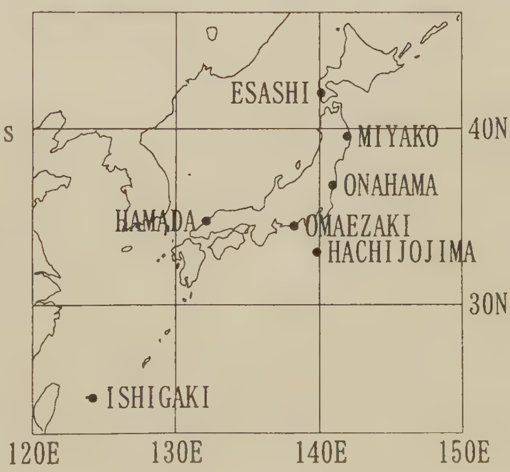



第13図　海域別旬平均海面水温平年偏差時系列図（つづき）

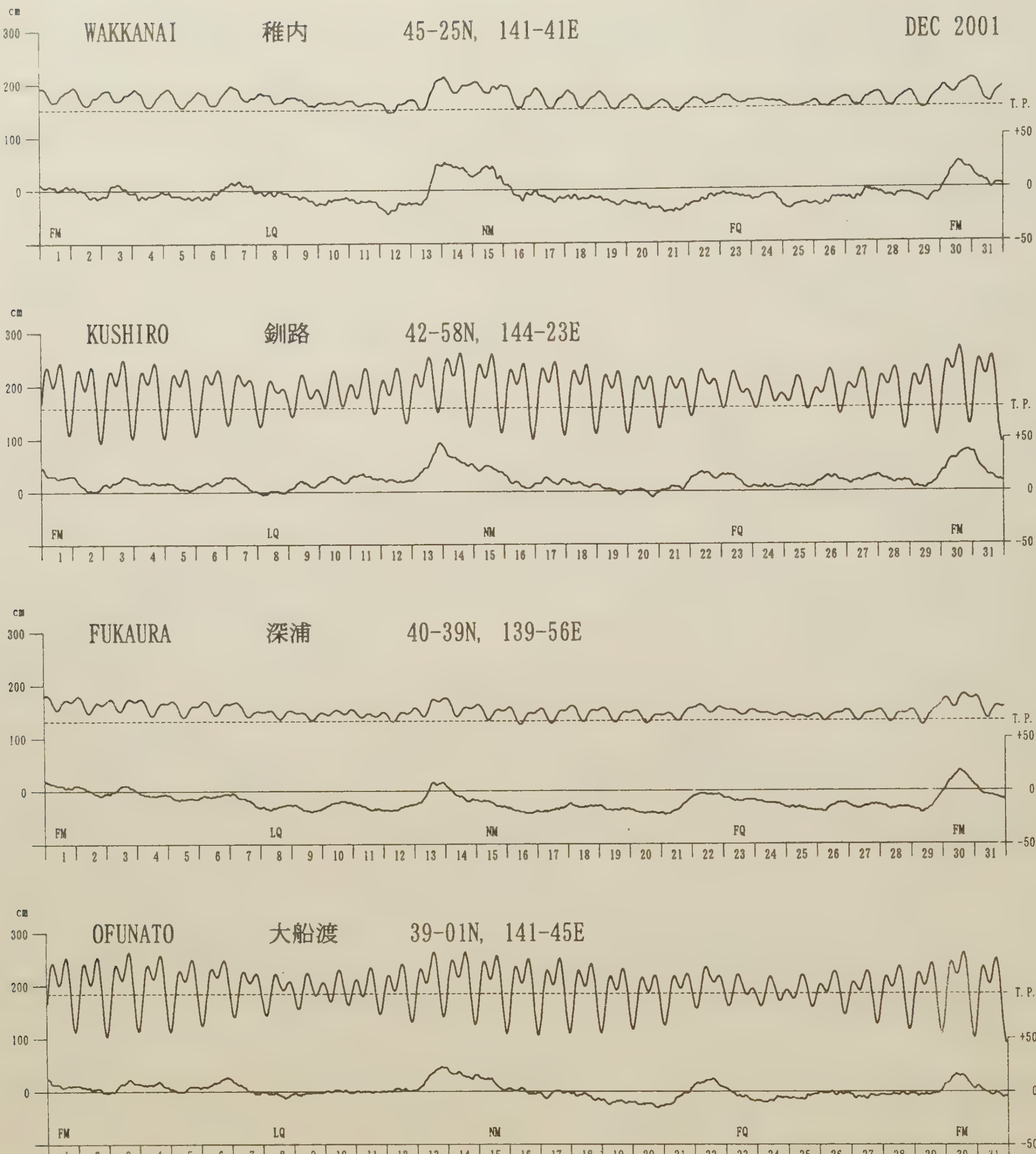
Fig. 13 (continue) Time series of the ten-day mean SST anomalies (°C) in the western North Pacific for the areas shown in the right panel. Negative anomalies are shaded. Anomalies are computed from the JMA climatology (1971-2000).




第14図 沿岸水温時系列図

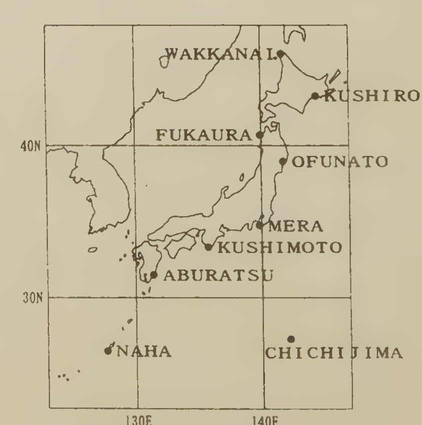
Fig. 14 Time series of hourly coastal water temperatures (°C) measured at 7 coastal stations of the JMA shown in the right panel.
Thin lines show ten-day mean climatology.



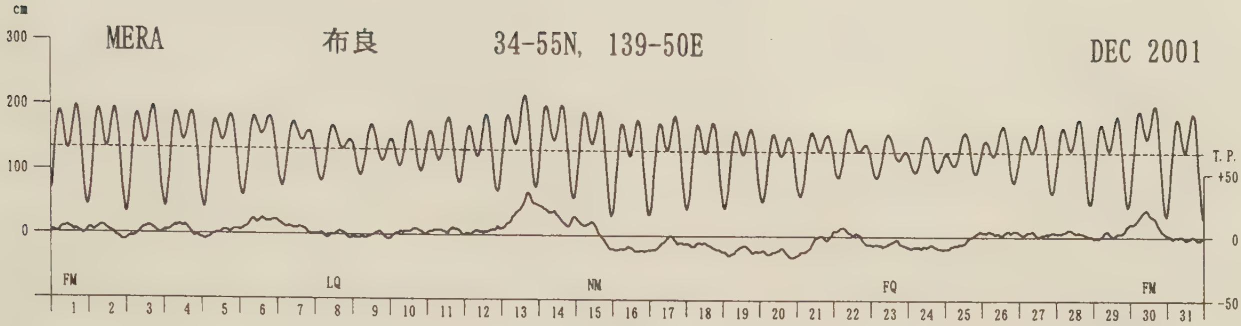

第15図 沿岸潮位時系列図（2001年12月）

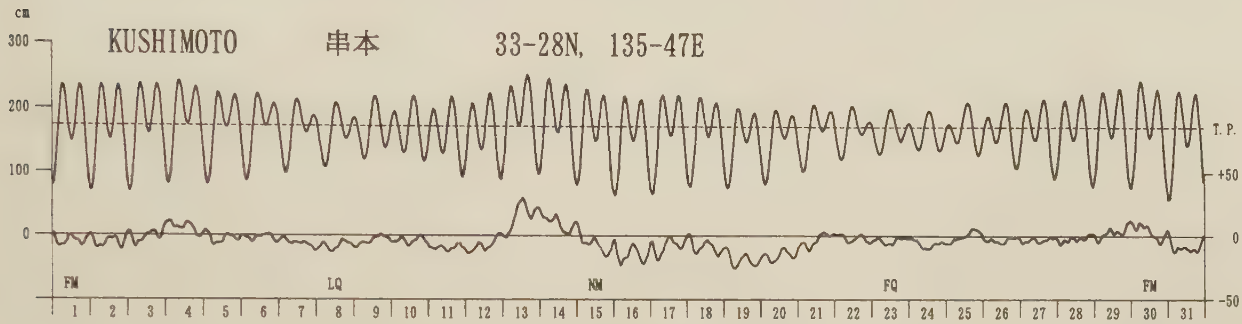
Fig. 15 Time series of hourly sea level observation (upper line) and its anomalies (lower line) at 9 stations of the JMA in the right panel.
Short term variations are removed from raw data.

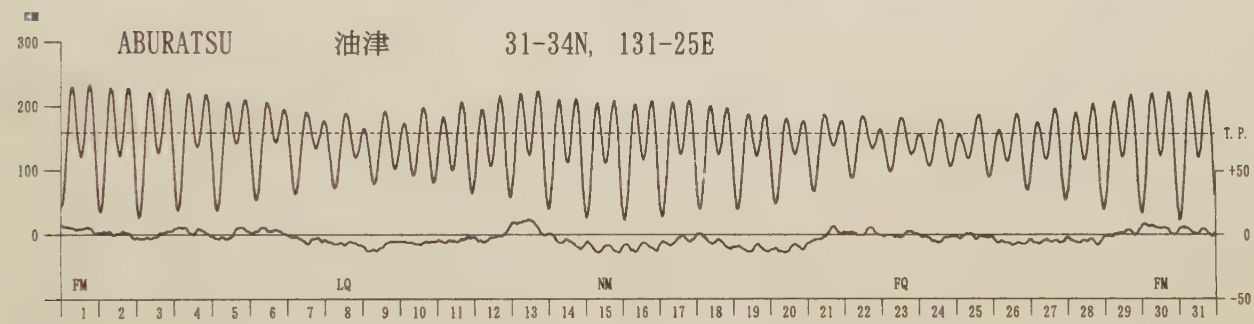
NM: new moon, FQ: first quarter
FM: full moon, LQ: last quarter
T. P. : Mean sea level of Tokyo Bay (Tokyo Peil)

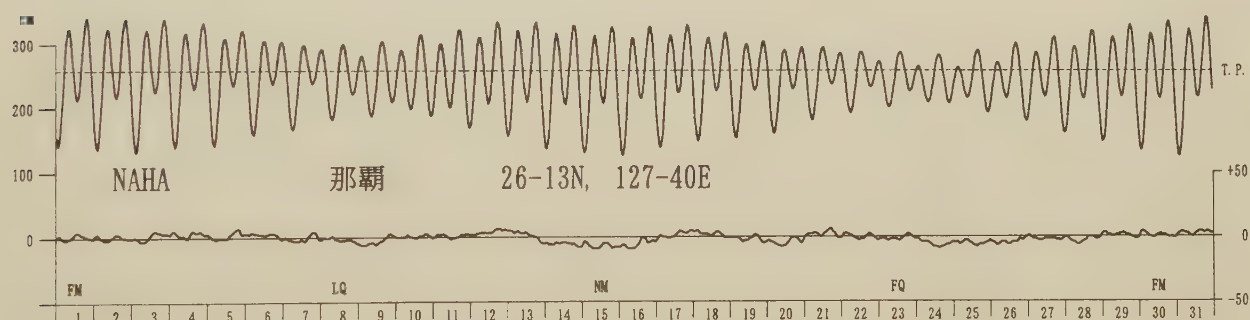


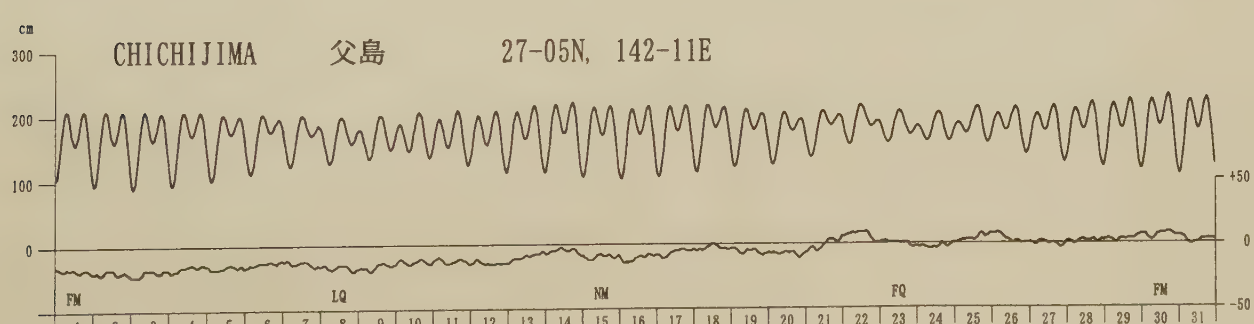
# Time series of Sea Level



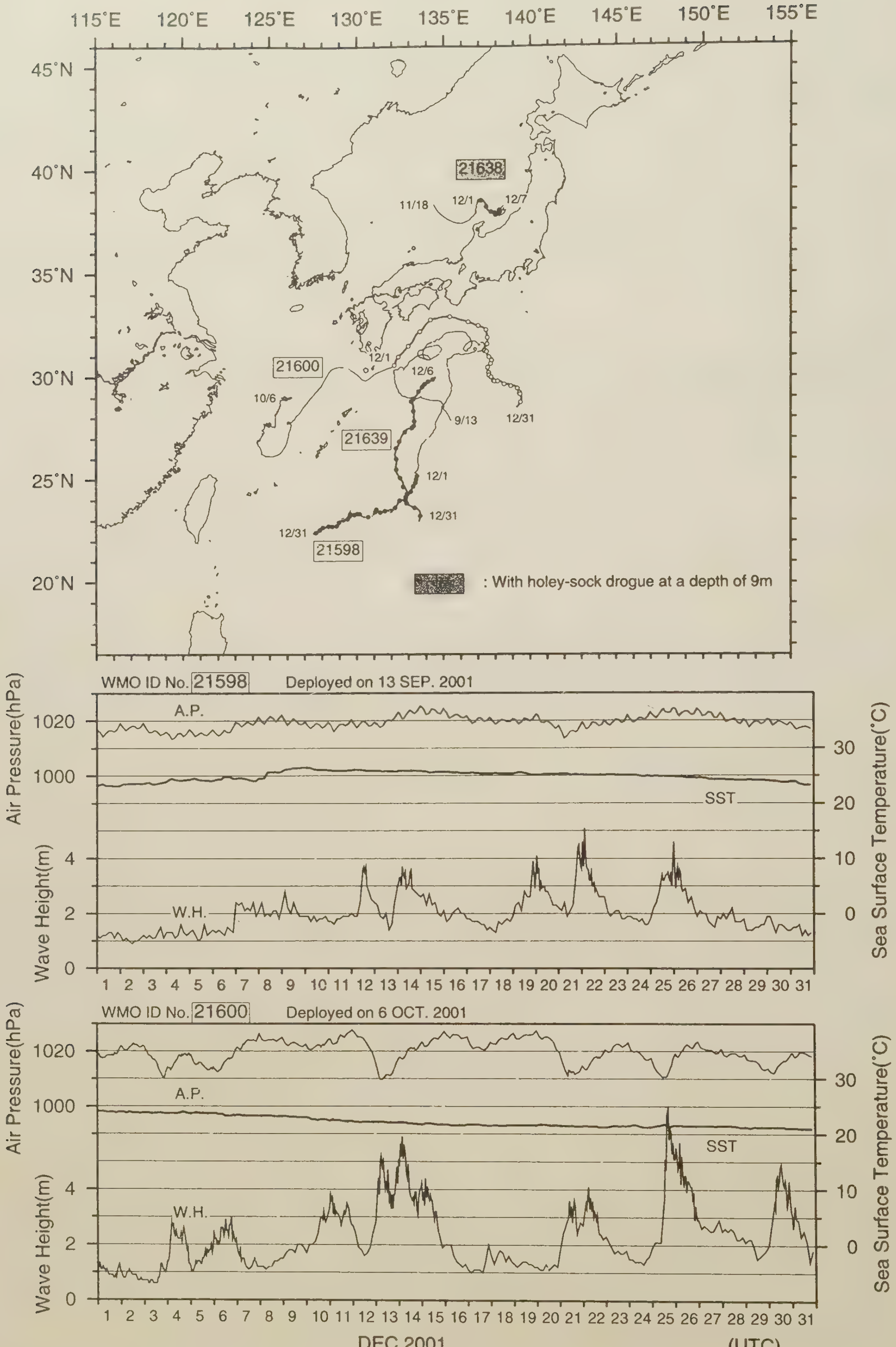



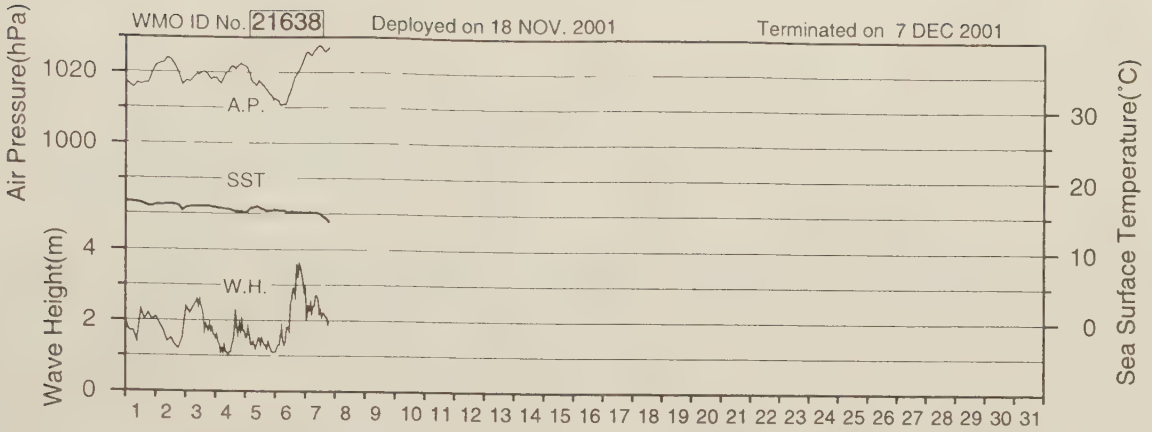

第15図 つづき

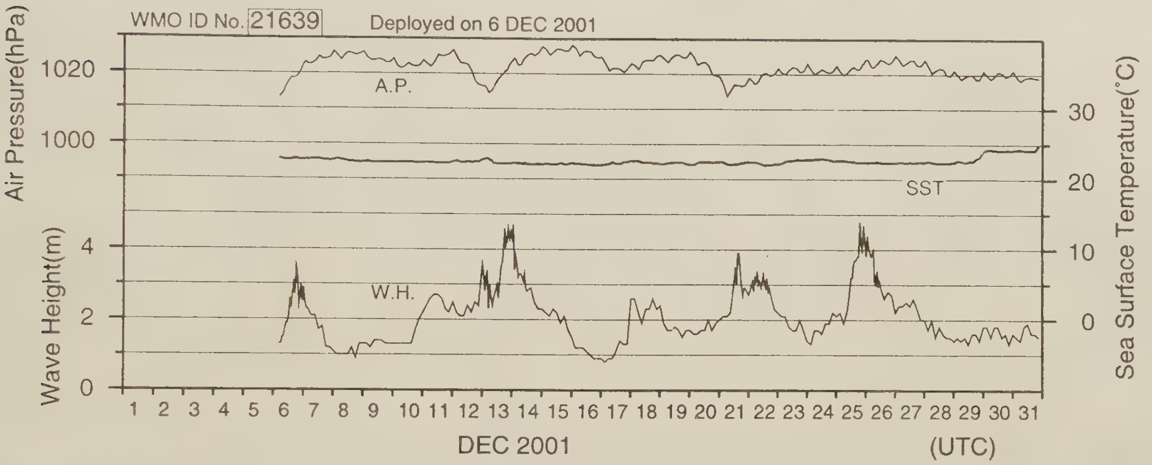
Fig. 15 continue




第16図　漂流型海洋気象ブイロボットの軌跡と観測要素の時系列図

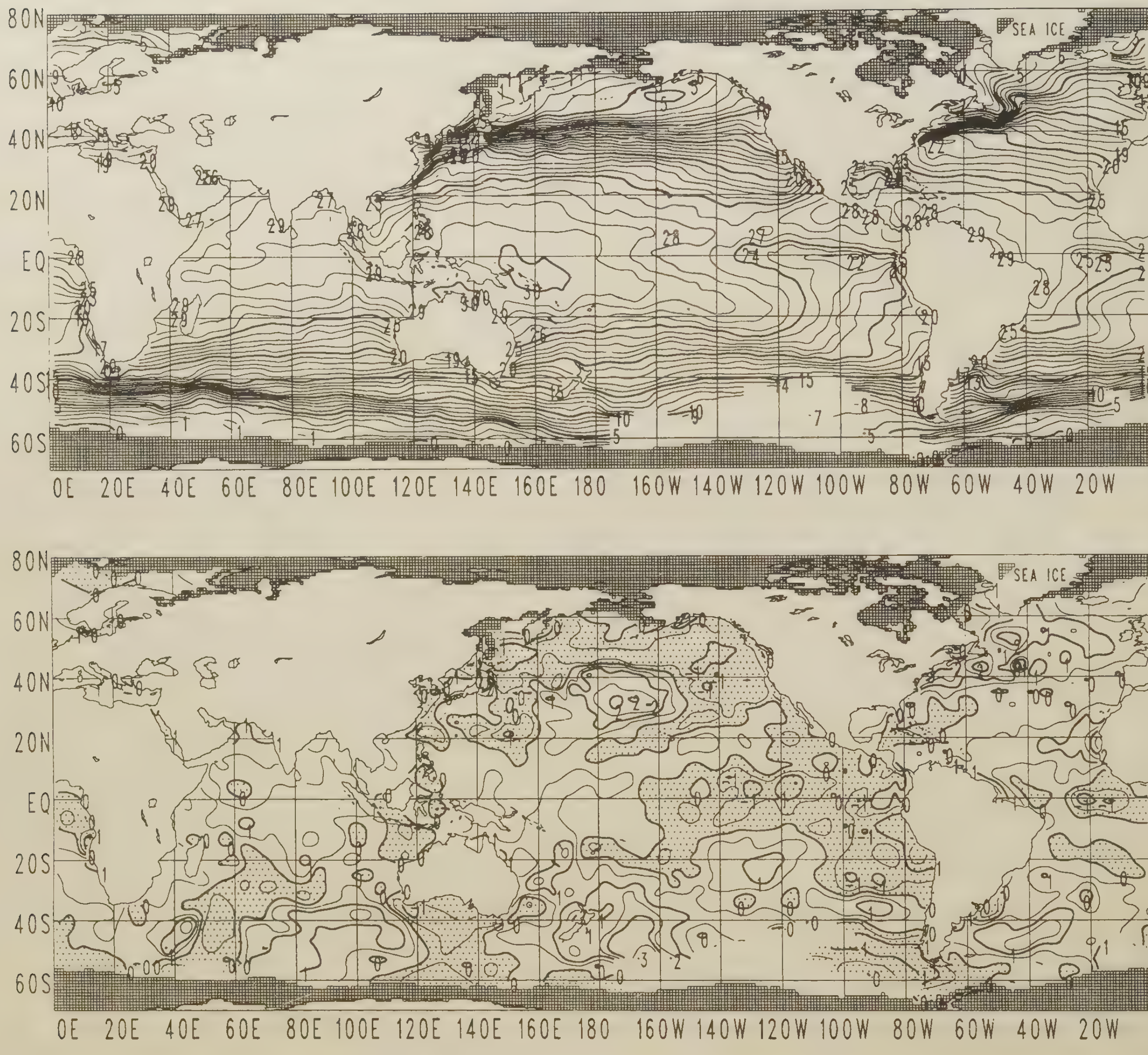
Fig.16　Time series of JMA drifting buoy observation.
The upper panel shows paths of the buoys. Circles denote the position at 00h UTC everyday.
The lower panel shows time series of observation data.



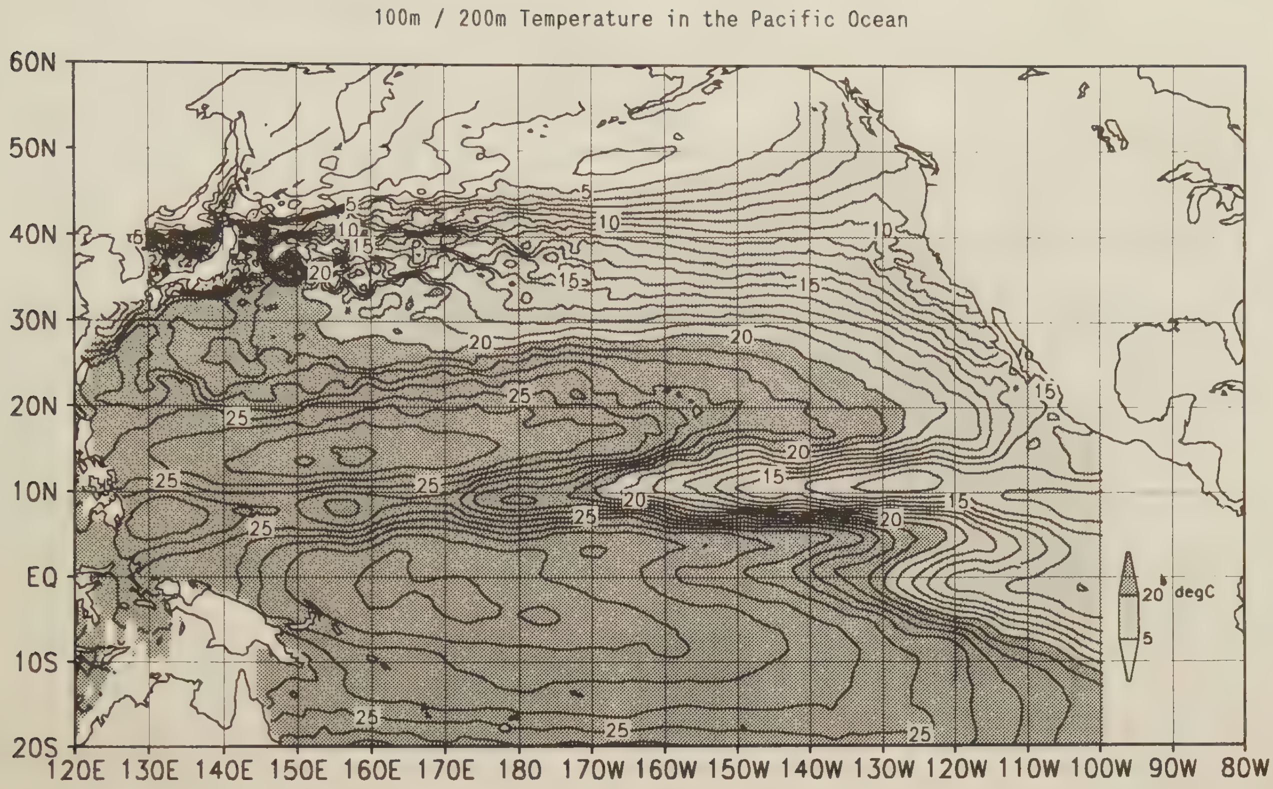

第16図 つづき
Fig.16 continue

# SST & Anomalies in the Global Ocean



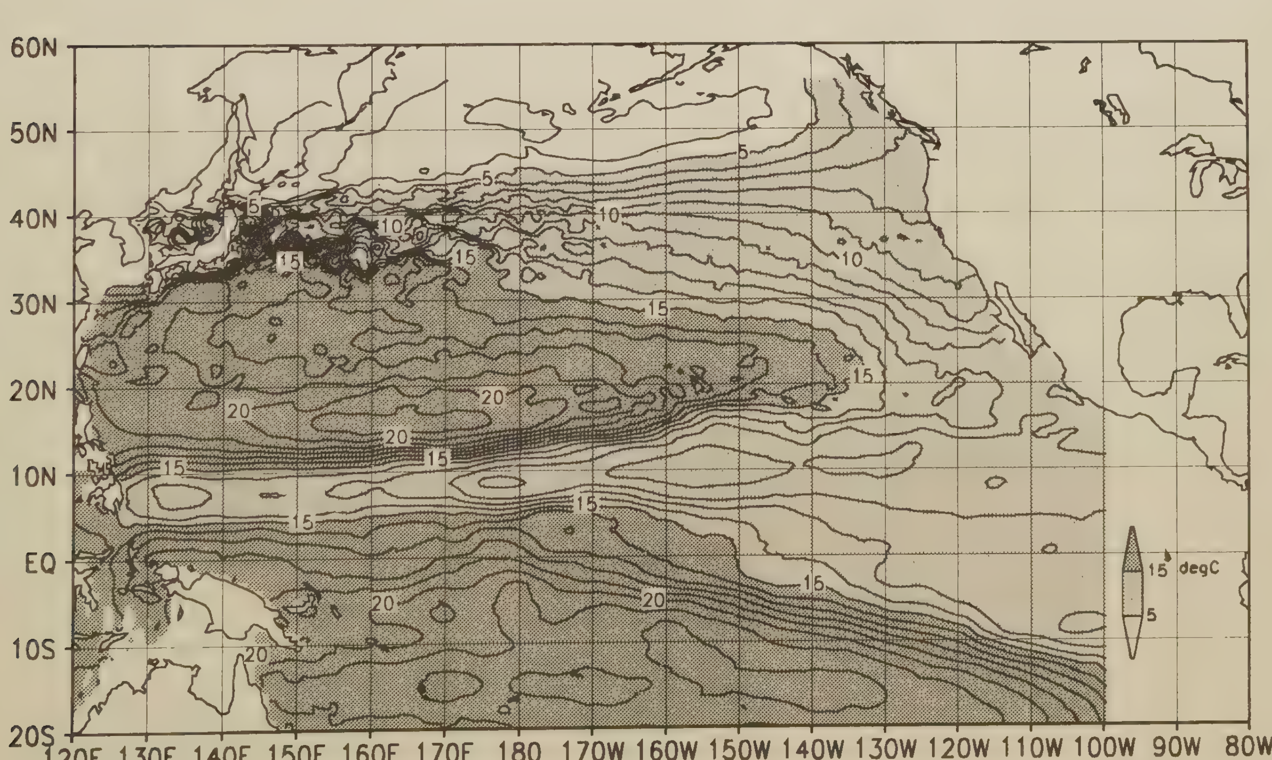

第17図　全球月平均海面水温図（上）及び偏差図（下）（2001年12月）

Fig. 17 Monthly mean SST over the global ocean (top) and anomalies (bottom) for DEC 2001. Anomalies are computed from the JMA climatology (1971-2000). Contour interval is 1°C (top) and additional anomaly contours of ±0.5°C are shown by thin lines. Negative anomalies are spotted. Maximum coverage of sea ice is shaded. Data sources for sea ice are U.S. National Ice Center (polar regions) and JMA (the Sea of Okhotsk).



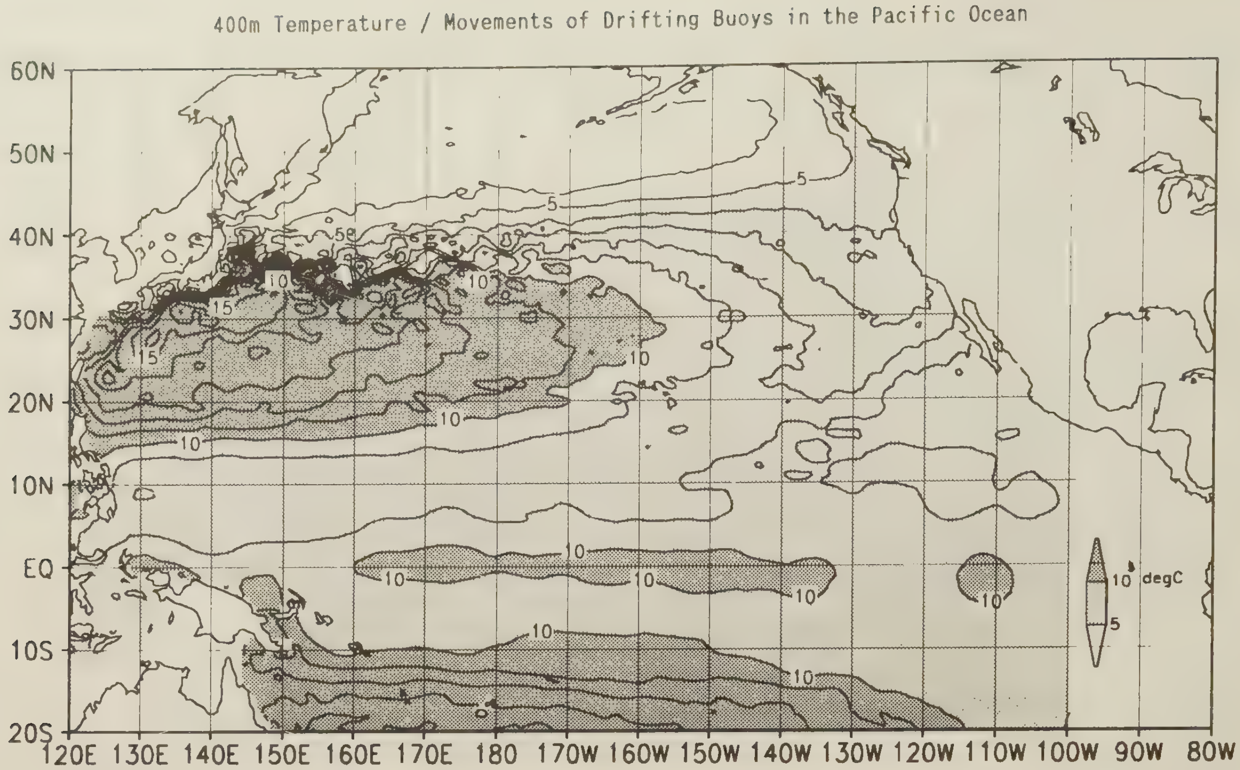

第 18 図　太平洋月平均表層水温図（深さ 100 m）（2001 年 12 月）
（海洋総合解析システムによる）

Fig. 18　Monthly mean subsurface (100 m) temperature in the Pacific Ocean for December 2001. Contour interval is 1 ℃. (calculated by the Ocean Comprehensive Analysis System)



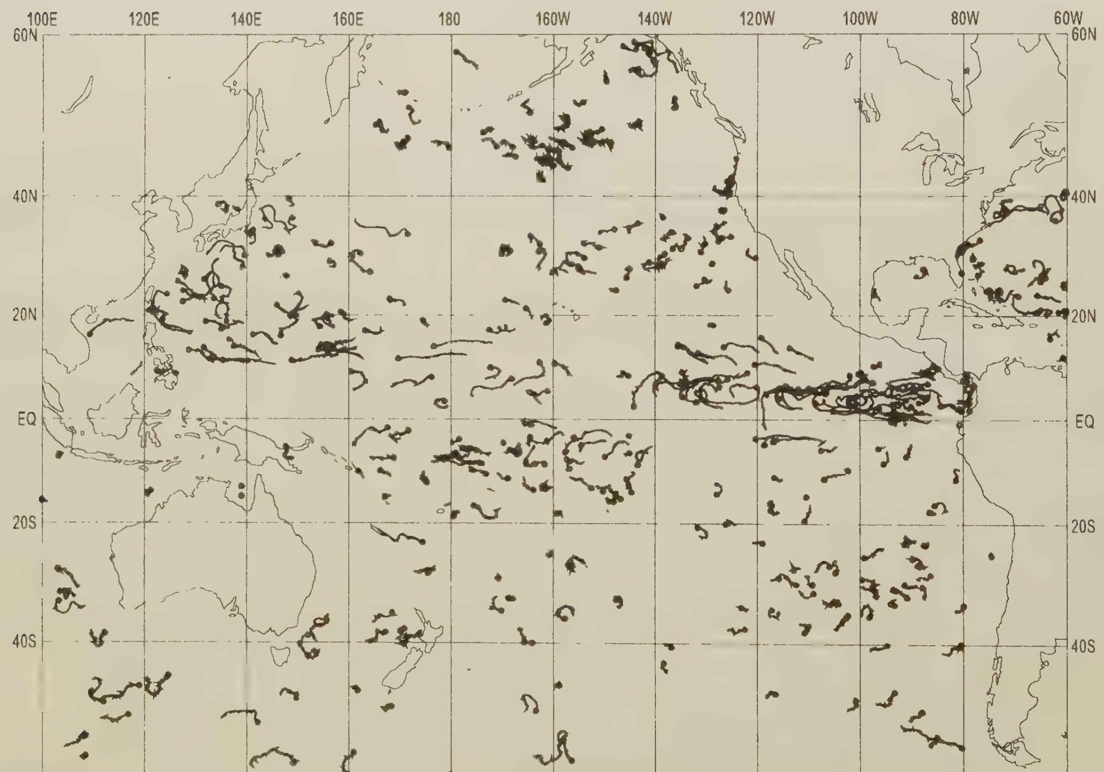

第 19 図　太平洋月平均表層水温図（深さ 200 m）（2001 年 12 月）
（海洋総合解析システムによる）

Fig. 19　Monthly mean subsurface (200 m) temperature in the Pacific Ocean for December 2001. Contour interval is 1 ℃. (calculated by the Ocean Comprehensive Analysis System)




第 20 図　太平洋月平均表層水温図（深さ 400 m）（2001 年 12 月）
（海洋総合解析システムによる）

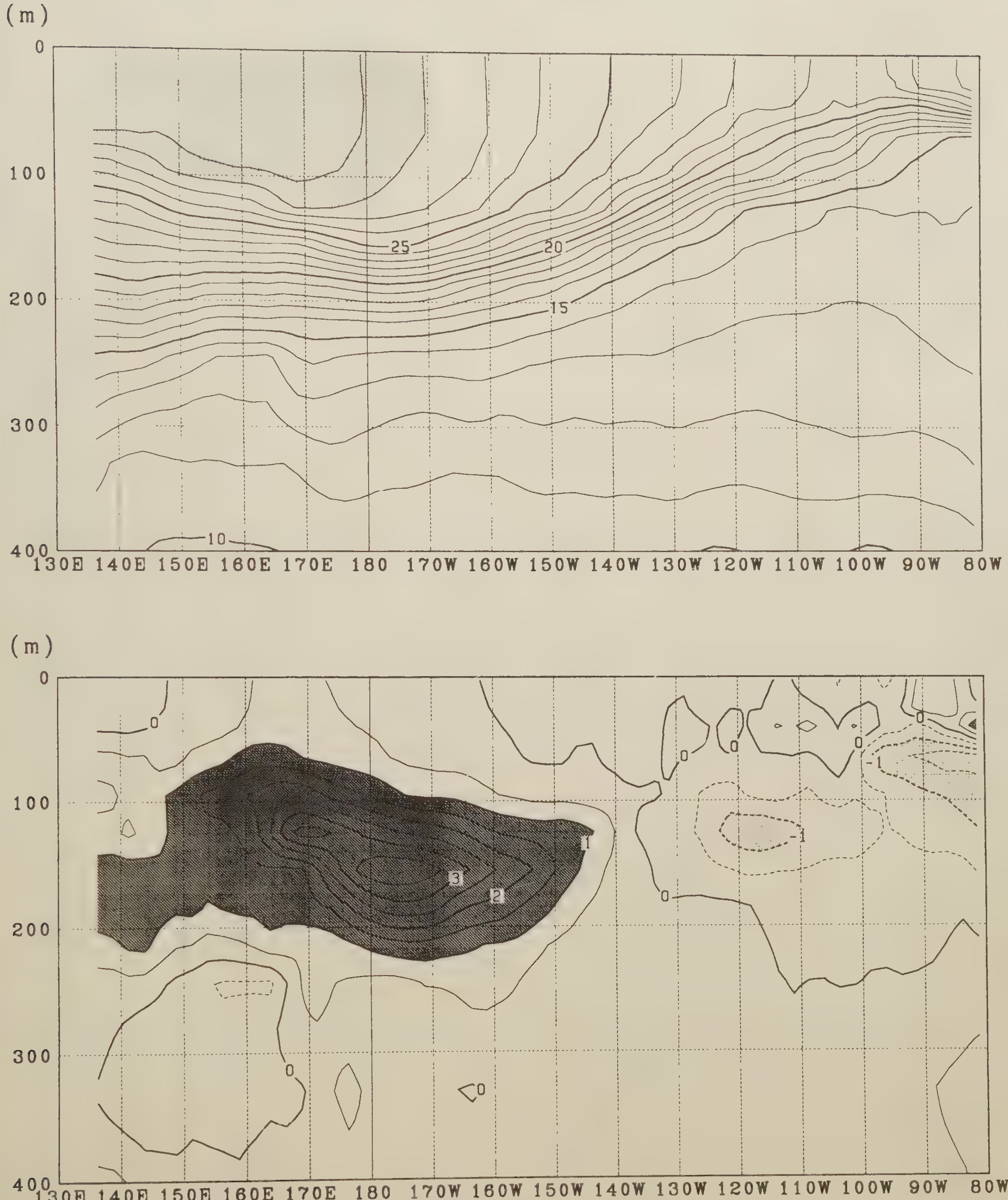
Fig. 20　Monthly mean subsurface (400 m) temperature in the Pacific Ocean for December 2001. Contour interval is 1 ℃. (calculated by the Ocean Comprehensive Analysis System)




第 21 図　太平洋ブイ流跡図（2001 年 12 月）

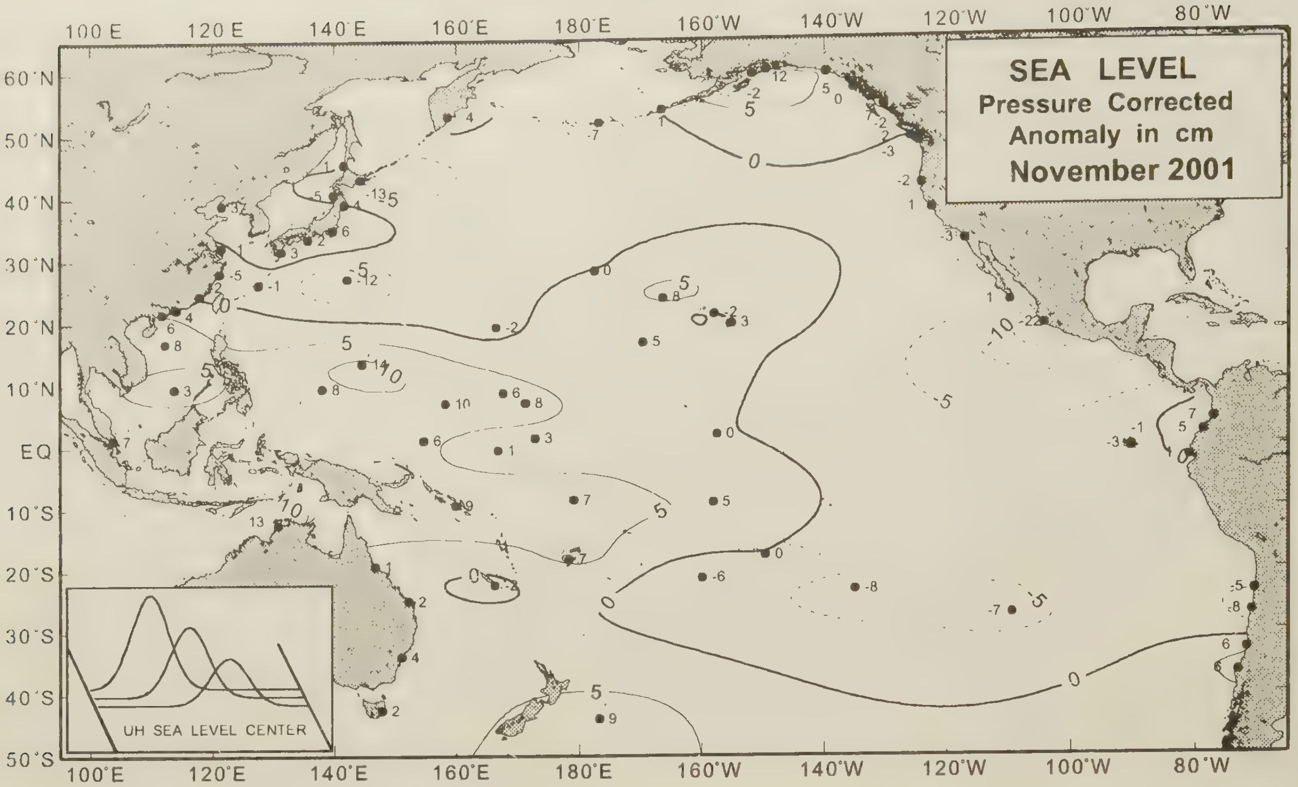
Fig. 21　Trajectories of drifting buoys in the Pacific Ocean during December 2001. Each track is for one buoy. Small circles represent the last positions for the month.

Depth-Longitude Sections of Equatorial Temperature & Anomalies



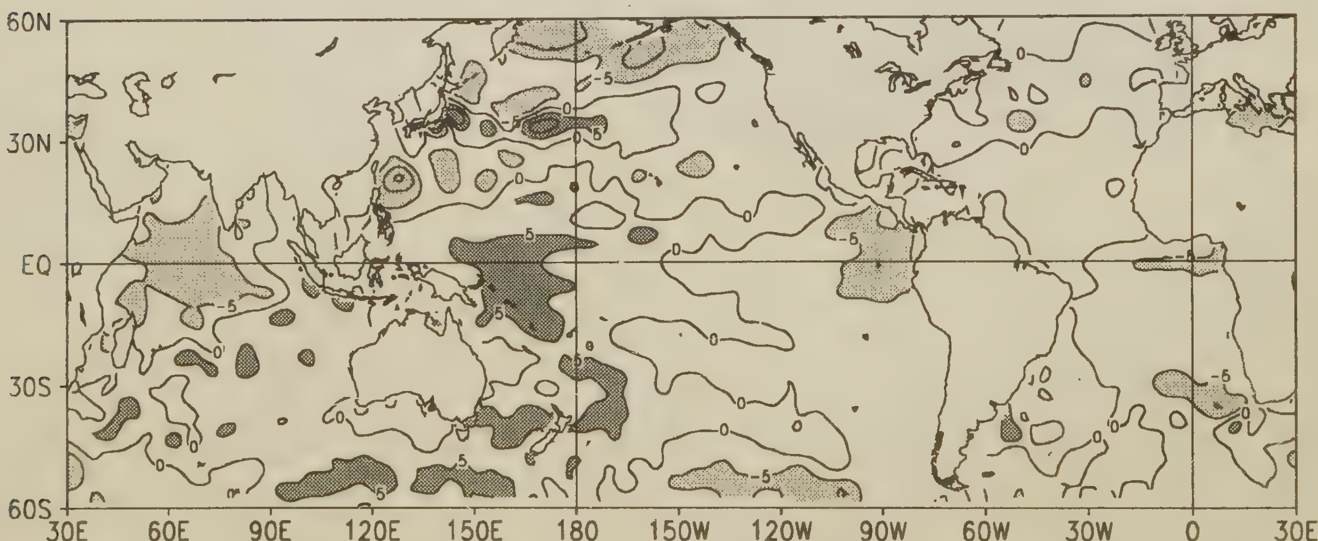

第22図　太平洋赤道に沿う表層水温（上）及び偏差（下）の深度－経度断面図（2001年12月）

Fig. 22 Depth-longitude sections of temperature (top) and anomalies (bottom) along the equator in the Pacific Ocean for DEC 2001. Data are derived from the Ocean Data Assimilation System of JMA. Contour interval is 1°C (top) and 0.5°C (bottom). Values greater than 28°C in the top panel are shaded. In the bottom panel, values greater than 1°C are shaded and values less than -1°C are spotted. Anomalies are computed from 1987-2000 base period means.




第 23 図　太平洋月平均海面水位偏差図 (2001 年 11 月)

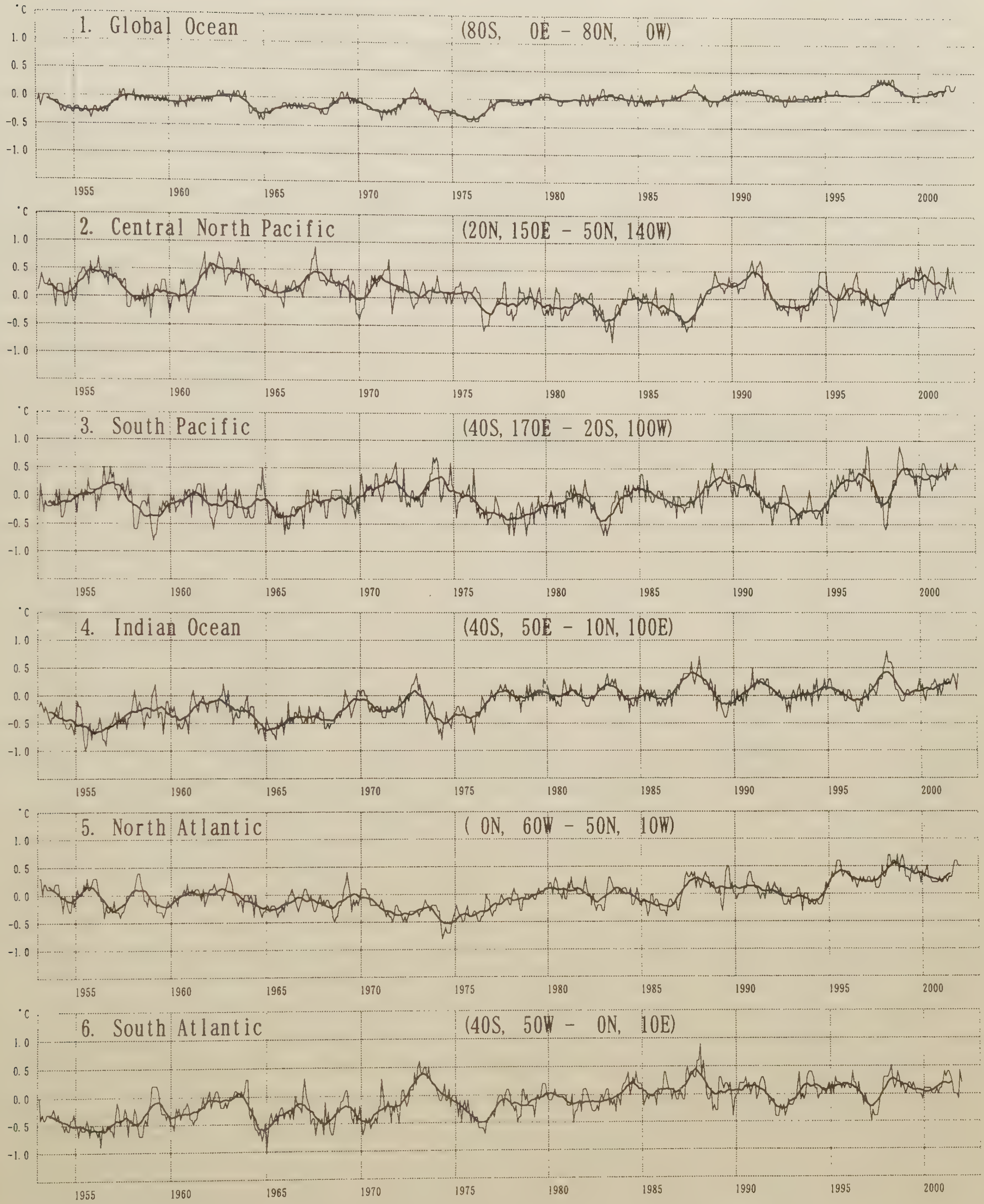
Fig. 23　Monthly sea level anomalies for November 2001 obtained from mean sea level (1975-1995) adjusted for atmospheric pressure. This figure is prepared by the SOC of ISLP-PAC, Department of Oceanography, University of Hawaii.




第 24 図　全球月平均海面高度偏差図 (2001 年 11 月)

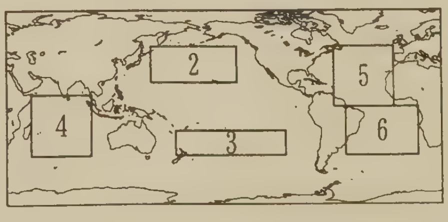
Fig. 24　Monthly sea surface height anomalies in the global ocean derived from the altimeter data of TOPEX/POSEIDON for November 2001. Contour interval is 5 cm. Positive anomalies exceeding +5 cm are shaded and negative anomalies exceeding -5 cm are spotted. Anomalies are computed from 1993-1998 base period means.

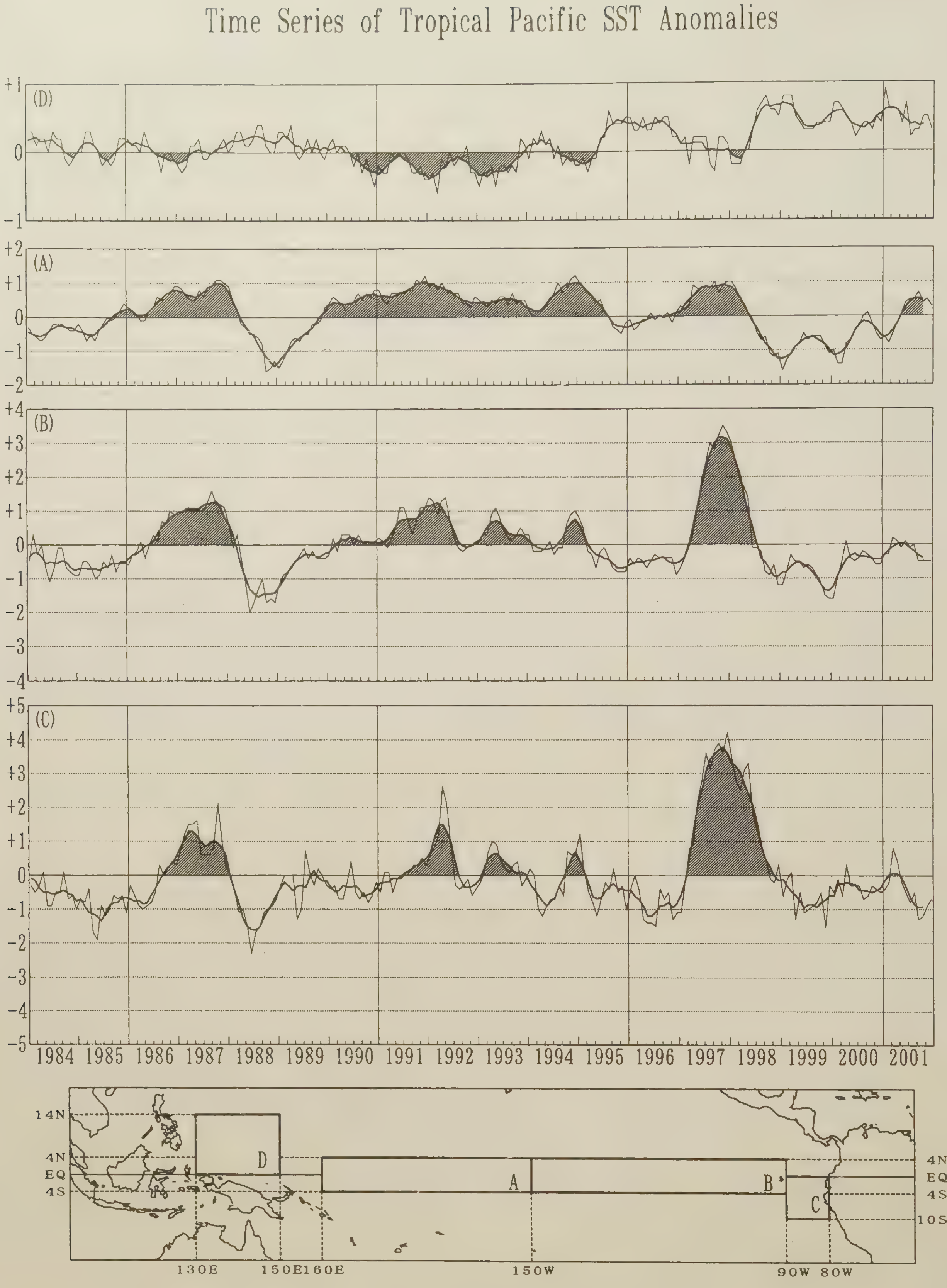
# Long-term Variation of Monthly Mean SST Anomalies




第25図 海域平均海面水温偏差の長期変動

Fig. 25 Long-term variations of monthly mean sea surface temperature anomalies (°C) for the areas shown in the right panel. Anomalies are computed from the JMA climatology (1971-2000). Thin lines show the monthly mean and thick lines their 13-month running means.






第26図　太平洋熱帯域の海面水温偏差時系列図

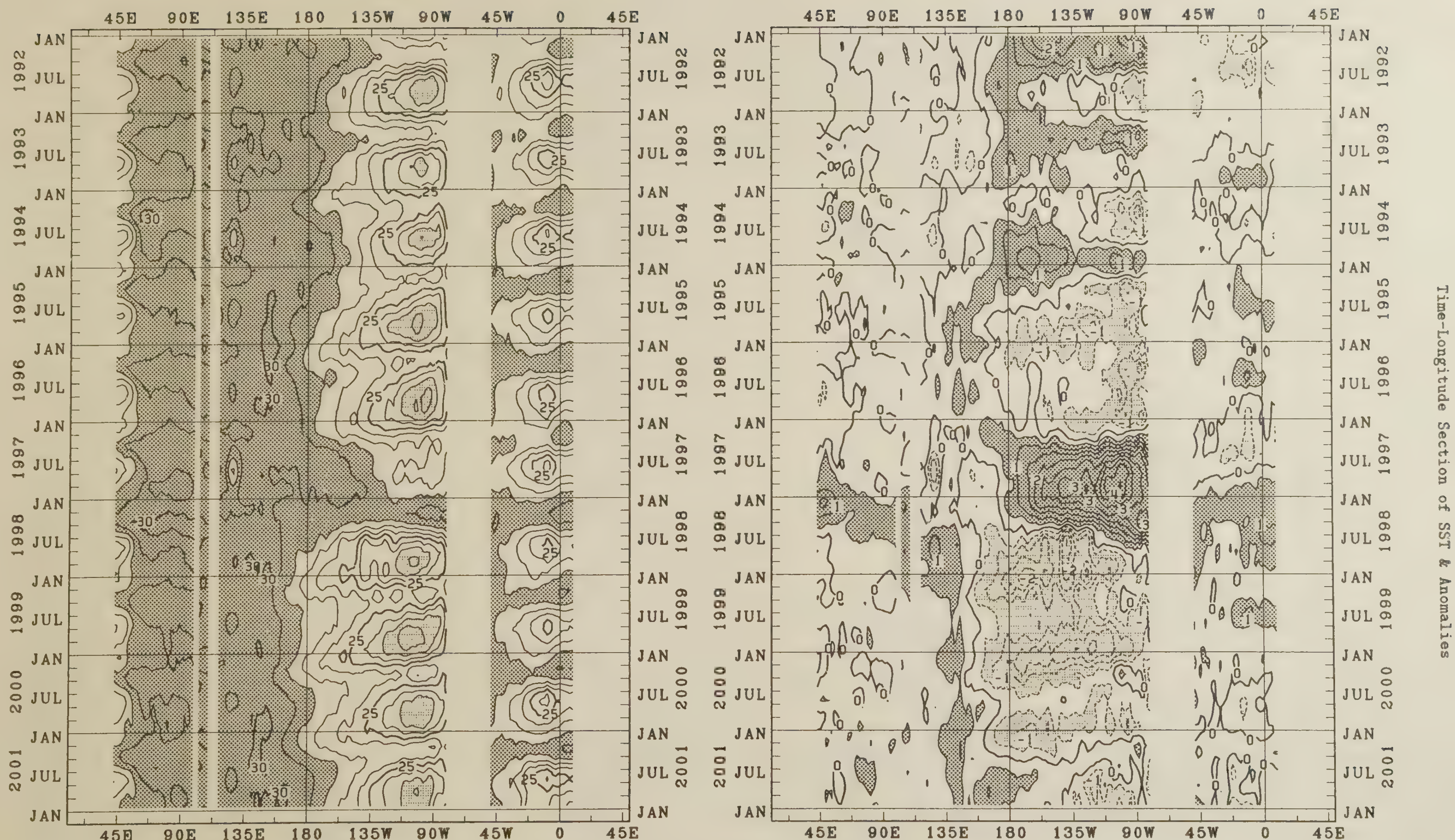
Fig. 26 Time series of monthly mean SST anomalies (°C) in the tropical Pacific Ocean for the areas indicated at the bottom panel. Thin lines show the monthly means and thick lines their 5-month running means. Positive anomalies (A, B, C) and negative anomalies (D) are shaded. Anomalies are computed from the JMA climatology (1971-2000).

Monitoring Indices in the Tropical Pacific

| MONTH YEAR | SEA SURFACE TEMPERATURE AND ANOMALY (°C) | | | | | | | | SOI | SEA LEVEL PRESSURE ANOMALY (hPa) | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | REGION D 14N-EQ 130E-150E | | REGION A 4N-4S 160E-150W | | REGION B 4N-4S 150W-90W | | REGION C EQ-10S 90W-80W | | SOI | TAHITI 17-33S 149-37W | DARWIN 12-24S 130-52E |
| JAN 99 | 29.3 | 0.8 | 26.4 | -1.6 | 24.2 | -1.2 | 23.9 | -0.6 | 1.5 | 2.2 | -1.2 |
| FEB 99 | 29.1 | 0.8 | 26.7 | -1.3 | 25.5 | -0.8 | 25.9 | -0.1 | 0.8 | 1.8 | -0.2 |
| MAR 99 | 29.3 | 0.8 | 27.0 | -1.1 | 26.8 | -0.3 | 26.4 | 0.1 | 0.9 | 0.9 | -1.2 |
| APR 99 | 29.3 | 0.5 | 27.3 | -0.9 | 26.7 | -0.5 | 24.1 | -1.3 | 1.6 | 2.0 | -0.5 |
| MAY 99 | 29.7 | 0.4 | 27.8 | -0.8 | 26.4 | -0.5 | 23.8 | -0.5 | 0.2 | 1.5 | 1.2 |
| JUN 99 | 29.7 | 0.3 | 28.0 | -0.5 | 25.5 | -0.7 | 21.8 | -1.1 | 0.3 | 1.2 | 0.7 |
| JUL 99 | 29.6 | 0.3 | 27.8 | -0.7 | 24.8 | -0.6 | 20.9 | -1.0 | 0.4 | 1.3 | 0.6 |
| AUG 99 | 29.5 | 0.3 | 27.8 | -0.6 | 24.0 | -0.7 | 20.0 | -0.9 | 0.4 | 1.8 | 1.2 |
| SEP 99 | 29.7 | 0.4 | 27.8 | -0.6 | 23.8 | -0.9 | 19.7 | -0.8 | 0.0 | 0.6 | 0.6 |
| OCT 99 | 29.8 | 0.4 | 27.8 | -0.6 | 23.6 | -1.1 | 20.4 | -0.5 | 1.1 | 1.7 | -0.0 |
| NOV 99 | 29.7 | 0.4 | 27.5 | -0.9 | 23.2 | -1.5 | 20.3 | -1.5 | 1.2 | 1.6 | -0.4 |
| DEC 99 | 29.4 | 0.4 | 27.1 | -1.1 | 23.4 | -1.6 | 22.6 | -0.3 | 1.6 | 2.6 | -0.3 |
| JAN 00 | 29.2 | 0.7 | 27.0 | -1.0 | 23.8 | -1.6 | 24.0 | -0.5 | 0.5 | 1.7 | 0.6 |
| FEB 00 | 29.0 | 0.7 | 26.6 | -1.4 | 25.3 | -1.0 | 25.9 | -0.1 | 1.2 | 3.1 | 0.2 |
| MAR 00 | 29.1 | 0.6 | 26.7 | -1.4 | 26.6 | -0.5 | 25.7 | -0.6 | 1.1 | 2.1 | -0.2 |
| APR 00 | 29.3 | 0.5 | 27.4 | -0.8 | 27.3 | 0.1 | 25.7 | 0.3 | 1.4 | 1.5 | -0.6 |
| MAY 00 | 29.7 | 0.4 | 27.9 | -0.7 | 26.5 | -0.4 | 24.0 | -0.3 | 0.3 | 1.2 | 0.8 |
| JUN 00 | 29.6 | 0.2 | 28.1 | -0.4 | 25.7 | -0.5 | 22.6 | -0.3 | -0.4 | 0.8 | 1.2 |
| JUL 00 | 29.6 | 0.3 | 28.2 | -0.3 | 25.0 | -0.4 | 21.6 | -0.3 | -0.3 | -0.1 | 0.5 |
| AUG 00 | 29.6 | 0.4 | 28.4 | 0.0 | 24.5 | -0.2 | 20.2 | -0.7 | 0.7 | 0.7 | -0.5 |
| SEP 00 | 29.7 | 0.4 | 28.5 | 0.1 | 24.4 | -0.3 | 19.9 | -0.6 | 1.0 | 2.0 | 0.2 |
| OCT 00 | 29.7 | 0.3 | 28.2 | -0.2 | 24.3 | -0.4 | 20.6 | -0.3 | 1.0 | 0.7 | -1.0 |
| NOV 00 | 29.8 | 0.5 | 27.9 | -0.5 | 24.1 | -0.6 | 21.4 | -0.4 | 1.9 | 1.6 | -1.9 |
| DEC 00 | 29.4 | 0.4 | 27.5 | -0.7 | 24.4 | -0.6 | 22.4 | -0.5 | 0.9 | -0.3 | -2.1 |
| JAN 01 | 29.4 | 0.9 | 27.4 | -0.6 | 25.1 | -0.3 | 24.1 | -0.4 | 0.8 | 3.0 | 1.1 |
| FEB 01 | 28.9 | 0.6 | 27.2 | -0.8 | 26.0 | -0.3 | 25.8 | -0.2 | 1.0 | -0.0 | -2.7 |
| MAR 01 | 29.1 | 0.6 | 27.6 | -0.5 | 27.3 | 0.2 | 27.1 | 0.8 | 0.8 | 1.8 | 0.2 |
| APR 01 | 29.4 | 0.6 | 28.0 | -0.2 | 27.3 | 0.1 | 25.8 | 0.4 | 0.2 | 0.4 | 0.2 |
| MAY 01 | 29.7 | 0.4 | 28.7 | 0.1 | 26.8 | -0.1 | 24.1 | -0.2 | -0.8 | 0.2 | 1.3 |
| JUN 01 | 30.1 | 0.7 | 28.9 | 0.4 | 26.3 | 0.1 | 22.4 | -0.5 | 0.3 | 0.3 | -0.1 |
| JUL 01 | 29.5 | 0.2 | 29.0 | 0.5 | 25.3 | -0.1 | 21.1 | -0.8 | -0.3 | 0.3 | 0.8 |
| AUG 01 | 29.5 | 0.3 | 28.9 | 0.5 | 24.7 | 0.0 | 20.4 | -0.5 | -0.6 | -0.4 | 0.5 |
| SEP 01 | 29.6 | 0.3 | 29.1 | 0.7 | 24.2 | -0.5 | 19.2 | -1.3 | 0.2 | 0.3 | 0.0 |
| OCT 01 | 29.9 | 0.5 | 28.8 | 0.4 | 24.2 | -0.5 | 19.7 | -1.2 | -0.1 | -0.5 | -0.4 |
| NOV 01 | 29.8 | 0.5 | 28.9 | 0.5 | 24.2 | -0.5 | 20.9 | -0.9 | 0.7 | 1.1 | 0.0 |
| DEC 01 | 29.3 | 0.3 | 28.5 | 0.3 | 24.5 | -0.5 | 22.2 | -0.7 | -0.7 | -0.6 | 0.8 |

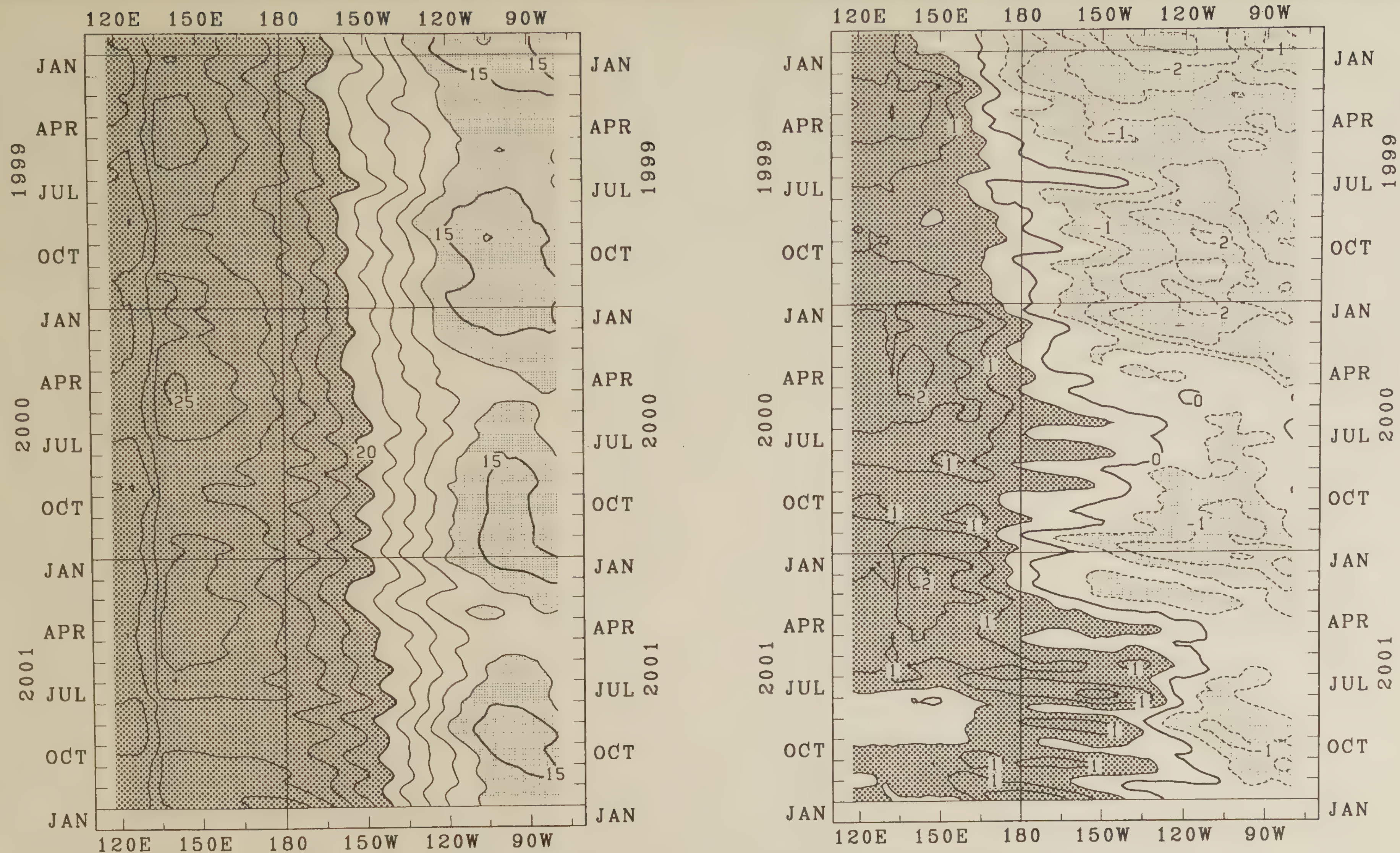
第1表　太平洋熱帯域の大気及び海洋の監視指数

Table 1 Atmospheric and oceanic monitoring indices in the tropical Pacific Ocean



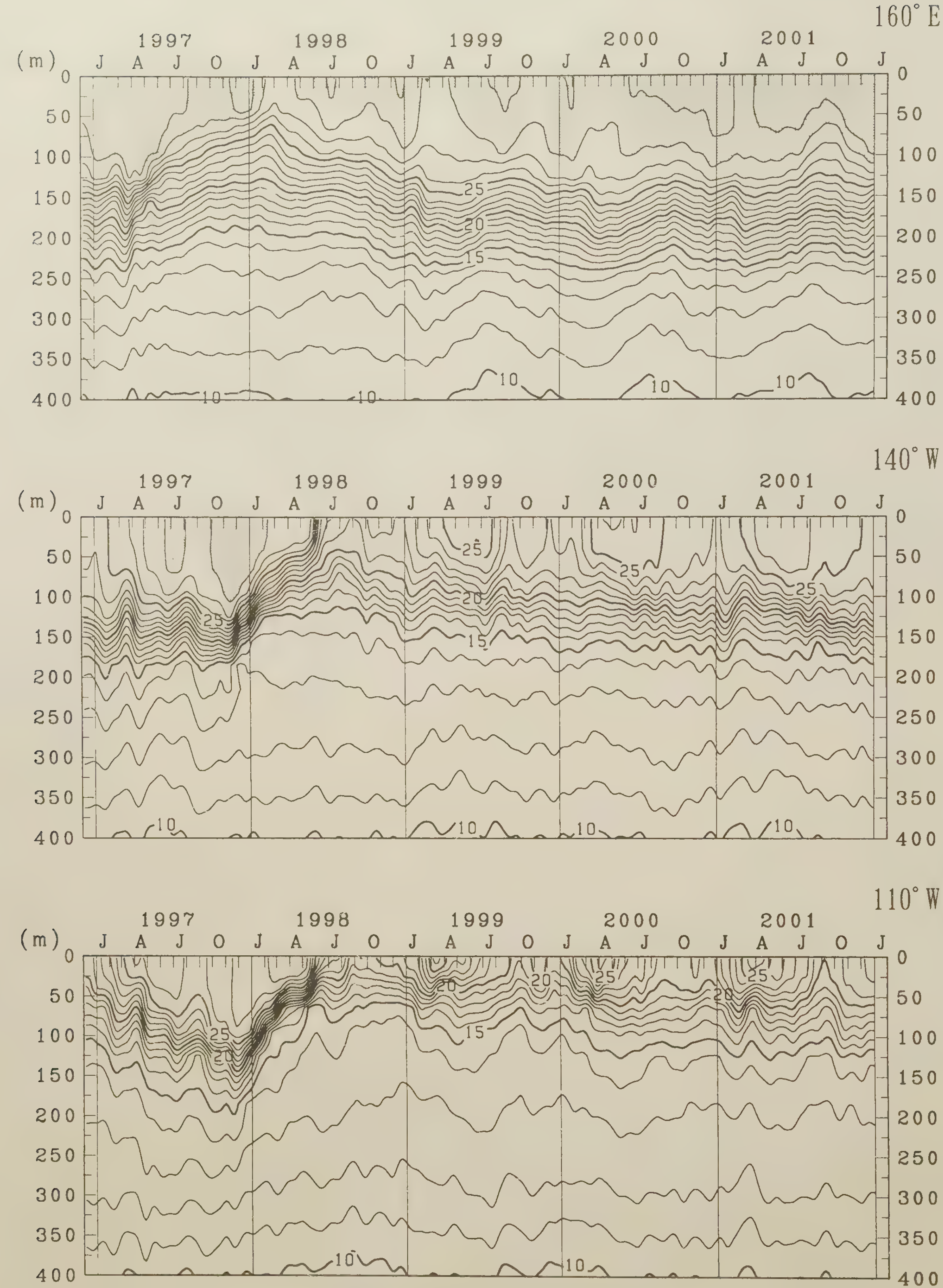

第 27 図　赤道に沿った海面水温（左）および偏差（右）の時間-経度断面図

Fig. 27　Time-longitude sections of SSTs (left) and anomalies (right) along the equator (2 °N-2 °S) in the global ocean. Contour interval is 1 °C (left) and 0.5 °C (right). Values greater than 28 °C are shaded and values less than 23 °C are spotted in the left panel. Dashed contours indicate negative anomalies in the right panel. Anomalies are computed from 1971-2000 base period means.




第28図　太平洋の赤道に沿う海洋表層の貯熱量（左）及び偏差（右）の時間－経度断面図

Fig. 28　Time-longitude sections of ocean heat content in the upper 260 m along the equator (left) and anomalies (right) in the Pacific Ocean. Data are derived from the Ocean Data Assimilation System of JMA. Contour interval is 1°C (left) and 0.5°C (right). Values greater than 20°C are shaded and values less than 16°C are spotted in the left panel. Dashed contours indicate negative anomalies in the right panel. Anomalies are computed from 1987-2000 base period means.




第29図　太平洋赤道域の表層水温の時間－深度断面図

（上：西部、中：中部、下：東部）

Fig. 29 Time-depth sections of equatorial subsurface temperature for the western Pacific (top, 160° E), the central Pacific (middle, 140° W) and the eastern Pacific (bottom, 110° W). Data are derived from the Ocean Data Assimilation System of JMA. Contour interval is 1° C. Values greater than 28° C are shaded.

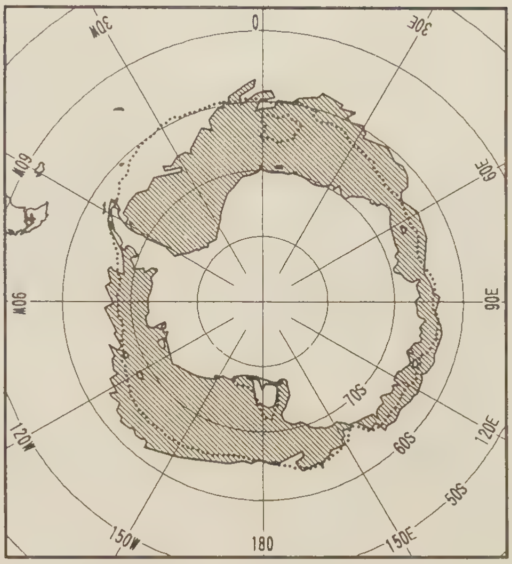



第30-1図　北極域の海氷図（2001年12月14日）

Fig.30-1 Sea ice chart in the Arctic on 14 Dec. 2001.

The shaded area represents the sea ice extent. The dotted line denotes the mean ice edge averaged for the period from 1972 through 1990.

The data source is the National Ice Center (USA).

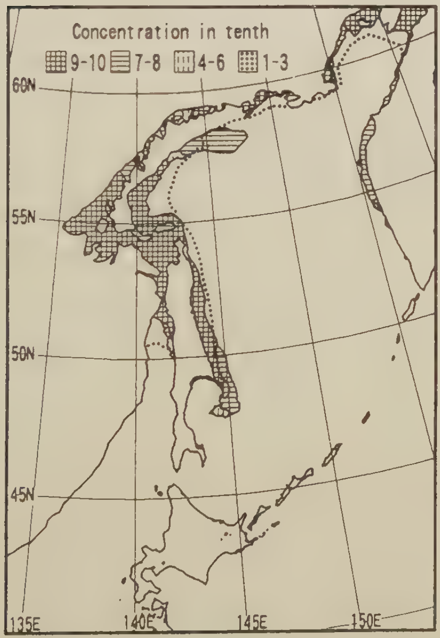



第30-2図　南極域の海氷図（2001年12月10日）

Fig.30-2 Sea ice chart in the Antarctic on 10 Dec. 2001.

The shaded area represents the sea ice extent. The dotted line denotes the mean ice edge averaged for the period from 1973 through 1990.

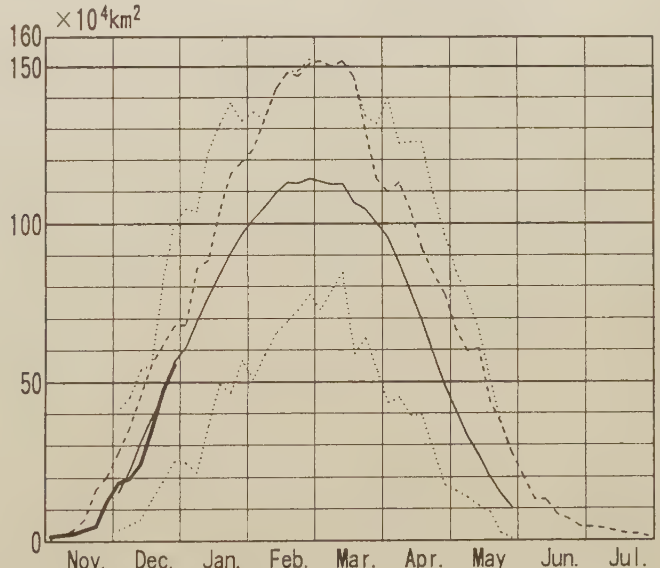
The data source is the National Ice Center (USA).




第30-3図 オホーツク海の海氷図（2001年12月15日）

Fig.30-3 Sea ice chart in the Sea of Okhotsk on 15 Dec. 2001.

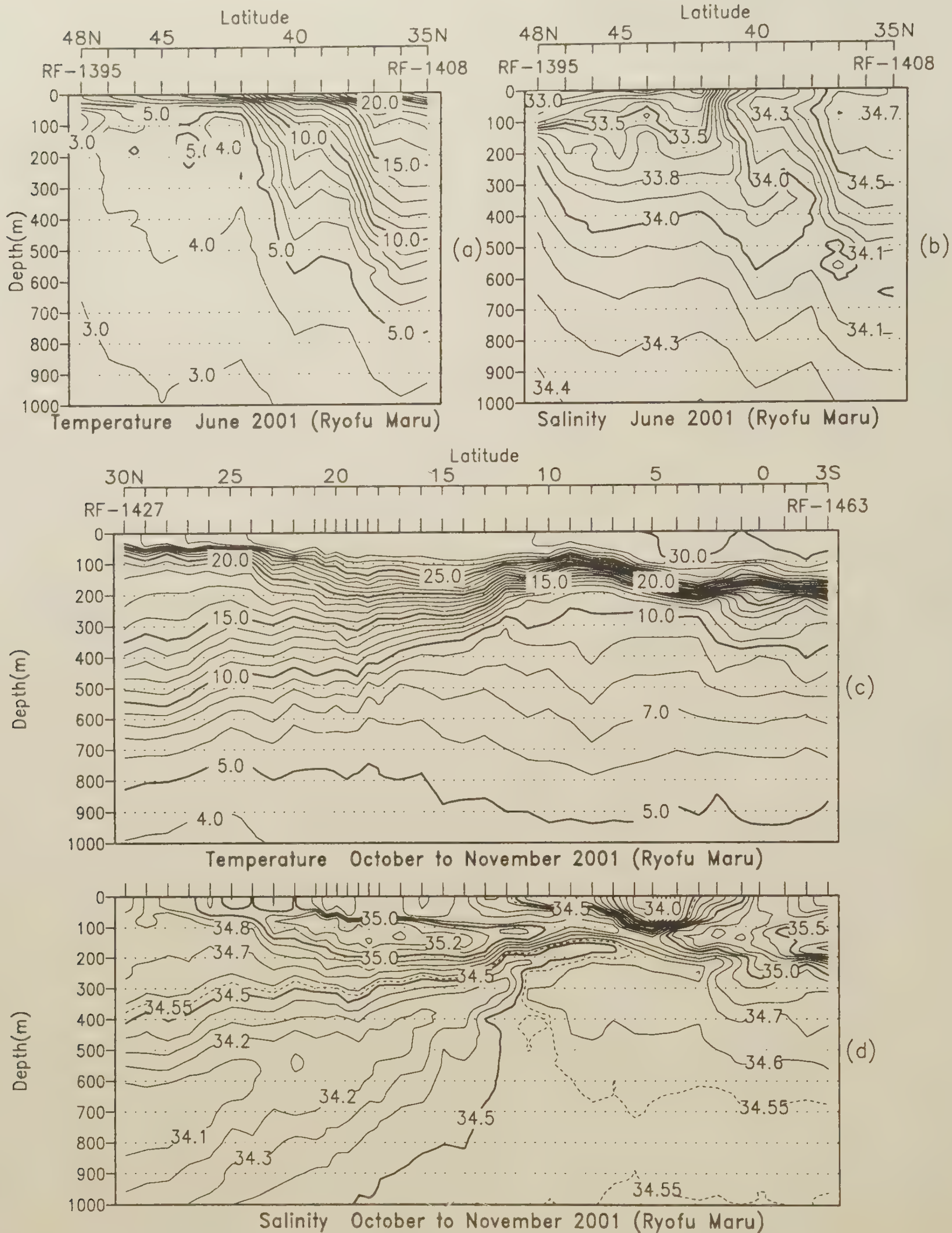
The dotted line denotes the mean ice edge averaged for the period from 1971 through 2000.




第30-4図 オホーツク海の海氷域面積

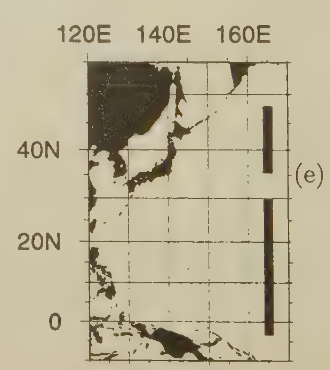
Fig.30-4 Time-series of 5-day sea ice area in the Sea of Okhotsk.

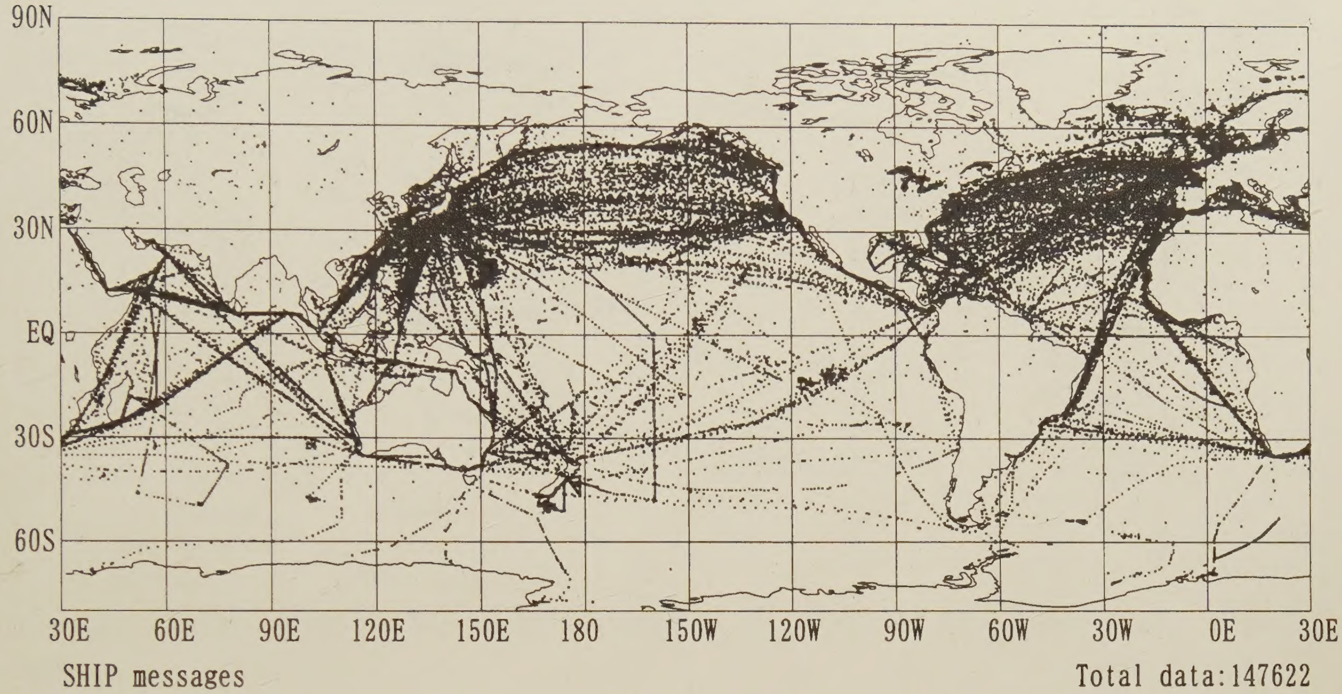
- ―― (thick solid line) : current season (2001/2002)
- ―― (solid line) : mean extent (1971-2000)
- ······ (dotted line) : maximum or minimum extent (1971-2001)
- - - - - (dashed line) : last season (2000/2001)

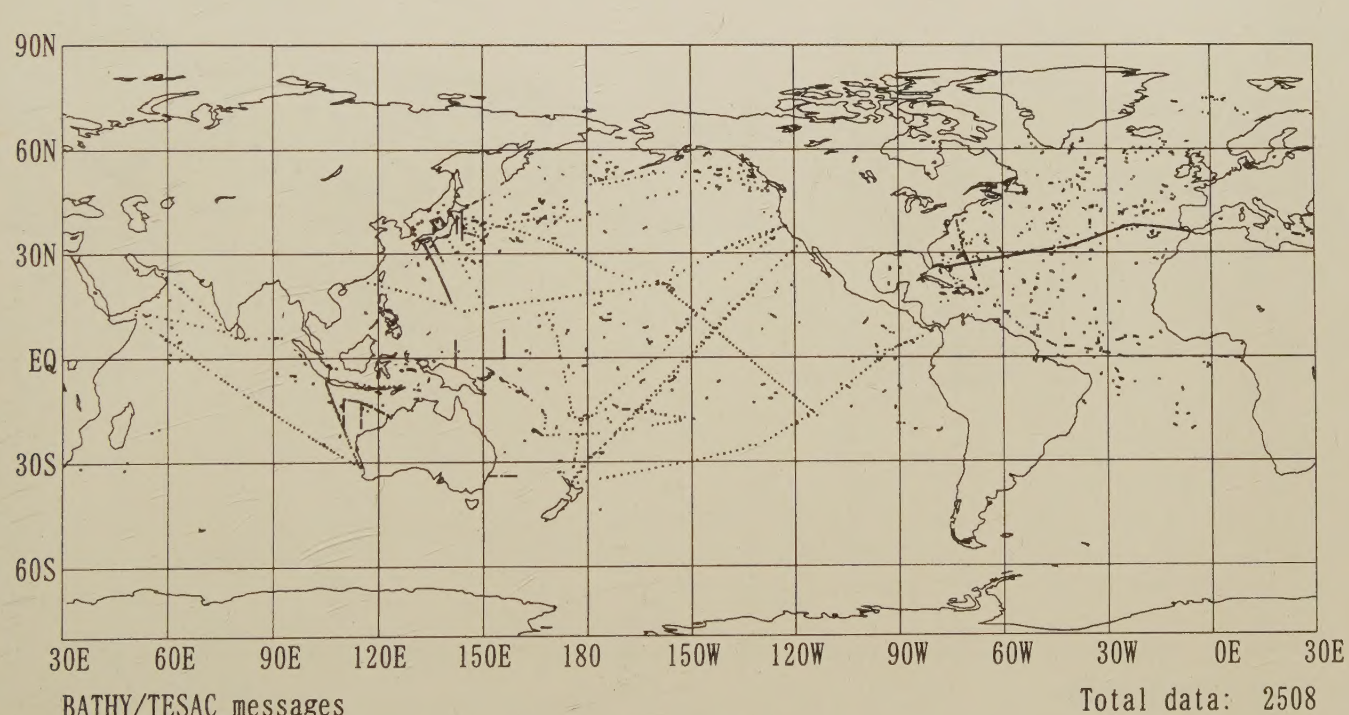



第 31 図 東経 165 度に沿った鉛直断面図. (a) 水温 (2001 年 6 月), (b) 塩分 (2001 年 6 月), (c) 水温 (2001 年 10～11 月), (d) 塩分 (2001 年 10～11 月), (e) 観測位置図.

**Fig. 31** Vertical sections along 165°E observed by R/V Ryofu Maru. (a) Water temperature observed in June 2001, (b) Salinity observed in June 2001, (c) Water temperature observed from October to November 2001, (d) Salinity observed from October to November 2001, (e) Location of oceanographic observations along 165°E.

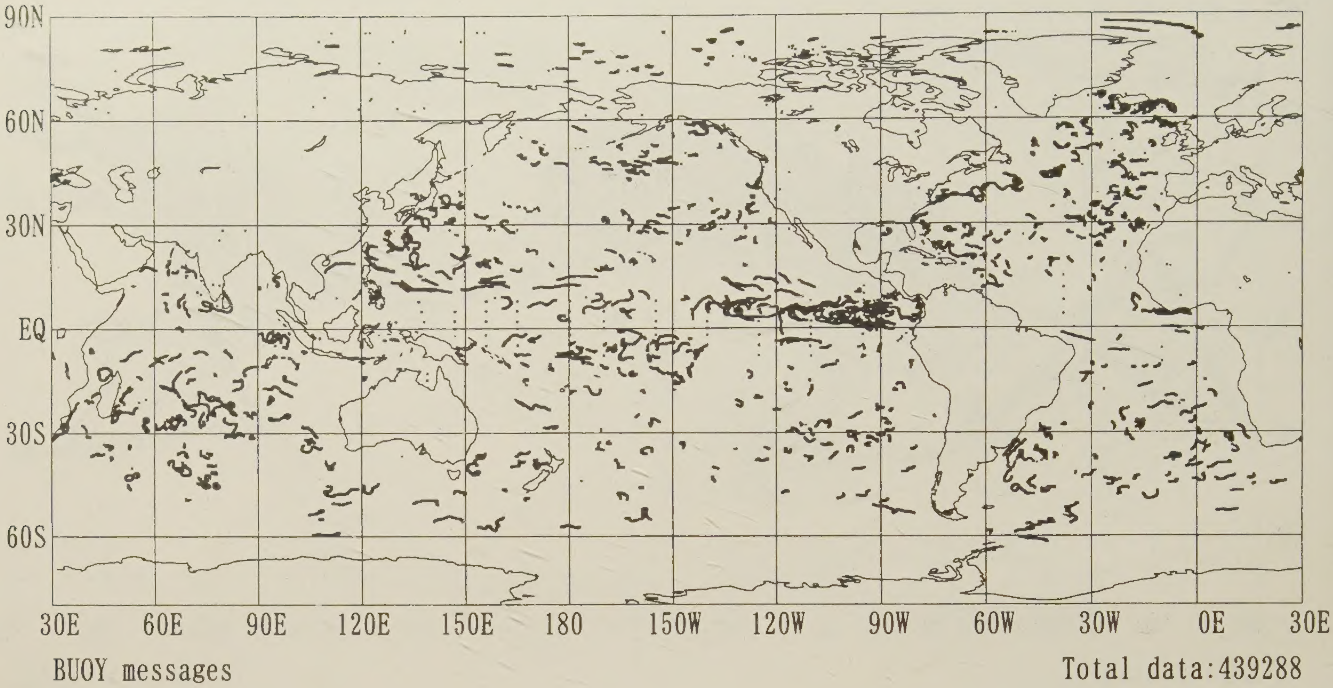


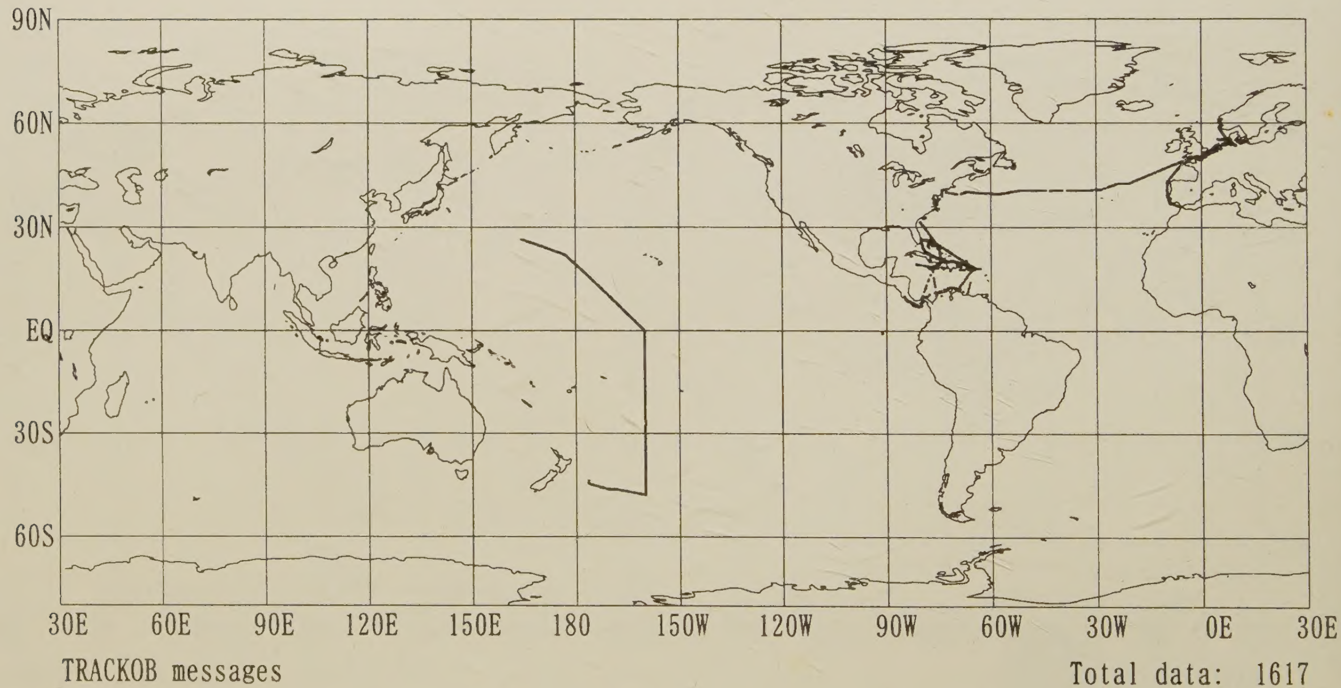



第32-1図 測点分布図(2001年12月)

Fig. 32-1 Geographical distribution of SHIP messages (SST data, top) and BATHY/TESAC messages (subsurface temperature data, bottom) for DEC 2001.




第32-2図　測点分布図(2001年12月)

Fig. 32-2　Geographical distribution of BUOY messages (buoy drift and SST data, top) and TRACKOB messages (ship drift and SST data, bottom) for DEC 2001.

# 気 象 庁 海 洋 月 報

## Monthly Ocean Report

## December 2001 (No. 108)

本月報掲載の2001年12月のプロダクトには、気象庁が観測したデータ及びGTS（全球気象通信網）を通じて入手した国際気象通報式による通報のほか、下記の機関等から提供いただいたデータを使用しています。御礼申し上げます。

防衛庁、水産庁、海上保安庁

水産総合研究センター

海洋科学技術センター、(社) 漁業情報サービスセンター

北海道大学、東京大学

水産試験場等（北海道、青森県、岩手県、宮城県、秋田県、山形県、福島県、茨城県、東京都、新潟県、富山県、石川県、福井県、静岡県、愛知県、三重県、兵庫県、和歌山県、鳥取県、山口県、徳島県、高知県、長崎県、宮崎県）

（順不同）

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